System Installation Guide

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DIGIDESIGN
Pro Tools®

System Installation Guide

Version 4.2 for all Pro Tools systems

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- To avoid the risk of shock, keep this equipment away from rain water, and other moisture. Do not use this equipment if it is wet.
- The equipment should only be connected to the correct rating power supply as indicated on the product.
- Do not attempt to service the equipment. There are no user-serviceable parts inside. Please refer all servicing to authorized Digidesign personnel.
- Any attempt to service the equipment will expose you to a risk of electric shock, and will void the manufacturer's warranty.
- The product should be connected only to the correct power supply as indicated on the product.

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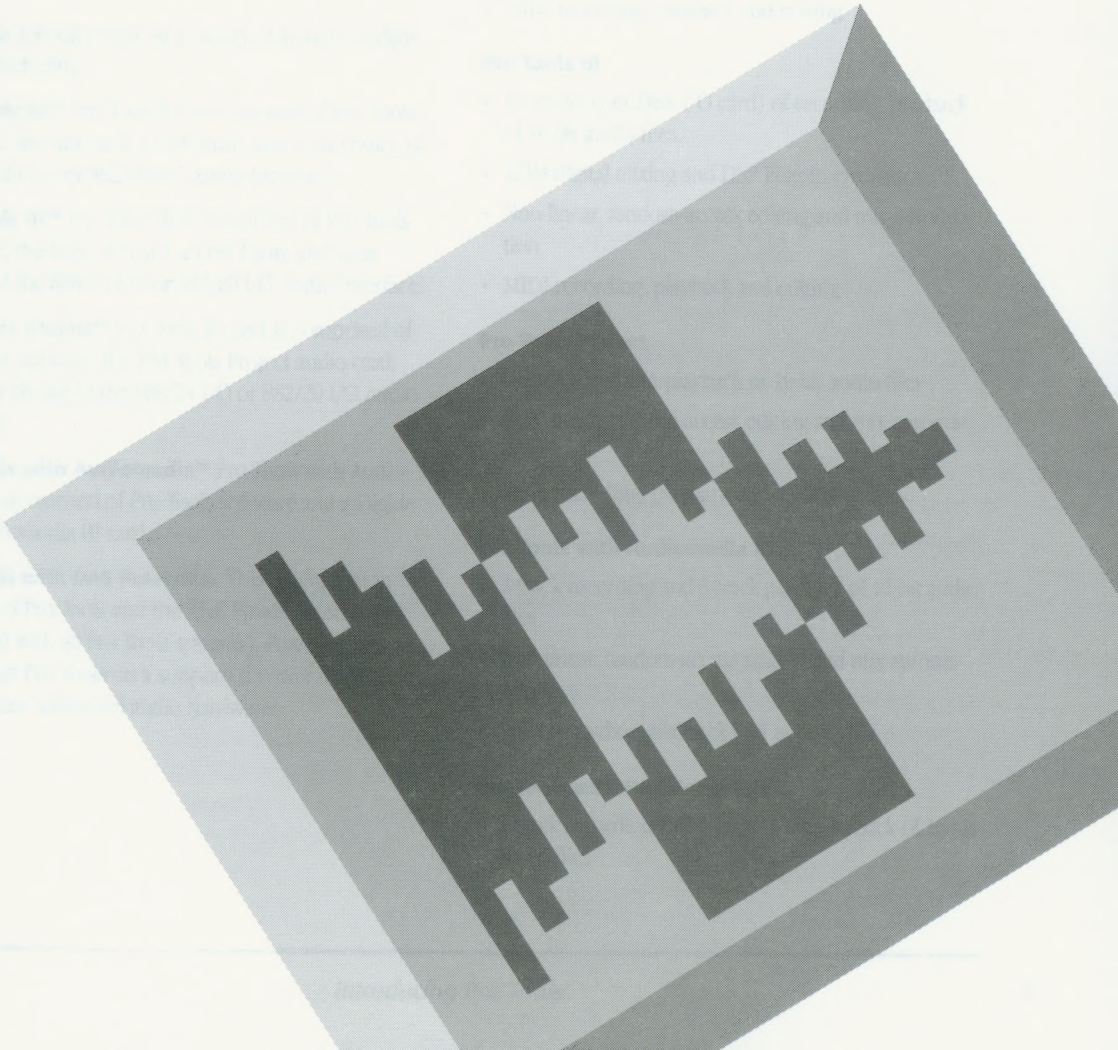
Introducing Pro Tools



Introducing Pro Tools

Chapter 1

Introducing Pro Tools

Introduction

Welcome to Pro Tools®, a Macintosh®-based digital audio production system that integrates random-access digital audio, mix automation, Plug-In effects processing, and MIDI. Pro Tools gives you the power to produce, record, edit, mix, and master professional-quality digital recordings on your desktop.

Pro Tools software runs on a variety of system configurations including:

Pro Tools 24™ Pro Tools 24 is comprised of Pro Tools software, the d24 card, a DSP Farm, and your choice of the 888/24 I/O or 882/20 I/O Audio Interface.

Pro Tools III™ Pro Tools III is comprised of Pro Tools software, the Disk I/O card, a DSP Farm, and your choice of the 888/24 I/O or 882/20 I/O Audio Interface.

Pro Tools Project™ Pro Tools Project is comprised of Pro Tools software, the Pro Tools Project audio card, and your choice of the 888/24 I/O or 882/20 I/O Audio Interface.

Pro Tools with Audiomedia™ Pro Tools with Audiomedia is comprised of Pro Tools software and a Digidesign Audiomedia III card.

Pro Tools with DAE PowerMix This configuration consists of Pro Tools and the DAE PowerMix software (included with all Pro Tools systems). PowerMix allows you to run Pro Tools on a supported Power Macintosh without any additional audio hardware.

Depending on your configuration, Pro Tools provides:

Pro Tools 24

- 32 tracks (per d24 card) of recording/playback of 24-bit and 16-bit audio files
- TDM digital mixing and DSP Plug-In environment
- Non-linear, random-access editing and mix automation
- MIDI recording, playback and editing

Pro Tools III

- 16 tracks (per Disk I/O card) of recording/playback of 16-bit audio files.
- TDM digital mixing and DSP Plug-In environment
- Non-linear, random-access editing and mix automation
- MIDI recording, playback and editing

Pro Tools Project

- 8-track recording/playback of 16-bit audio files
- Non-linear, random-access editing and mix automation
- MIDI recording, playback and editing

Pro Tools with Audiomedia III

- 2-track recording and 8-track playback of 16-bit audio files
- Non-linear, random-access editing and mix automation
- MIDI recording, playback and editing

Pro Tools with DAE PowerMix

- 2-track recording and 4- to 16-track playback of 16-bit audio files

- Non-linear, random-access editing
- Non-linear, random-access editing and mix automation
- MIDI recording, playback and editing

About This Installation Guide

This Installation Guide explains how to install your Pro Tools hardware and software and connect your studio. It assumes that you have a working knowledge of standard Macintosh operating techniques, including how to:

- Set up, start, and use your Macintosh
- Use the Finder and desktop icons to open, copy, and delete Macintosh files, applications, and disks
- Double-click, select, Shift-select, Shift-click, and drag with the mouse
- Open, close, scroll, move, resize, and select Macintosh windows
- Choose commands from the various menus

If you do not know how to do all of these tasks, spend some time learning your Macintosh before going any further.

System Requirements

The CPU, hard disk, monitoring and MIDI requirements for Pro Tools differ somewhat depending on which configuration you own. The following section lists the requirements for each configuration. Please refer to the section that describes your system before installing Pro Tools.

Pro Tools 24 and Pro Tools III Systems

CPU Requirements:

- A Digidesign-qualified, PCI-based Power Macintosh computer with the following amount of RAM:
  - · At least 64 MB for a core Pro Tools 24 system
  - · At least 128 MB for an expanded Pro Tools 24 system
  - · At least 48 MB for a Pro Tools III system

  Additional RAM is highly recommended if you plan to use a MIDI sequencer concurrently with Pro Tools. Virtual memory is not supported.
- Apple's System software version 8.0 or higher running in 32-bit mode
- Apple's QuickTime System Extension version 3.0 or higher (included with Pro Tools)
- A 17-inch or larger color monitor. Black and white monitors are not supported.

Hard Drive Requirements:

- Pro Tools 24 requires one or more Digidesign-approved SCSI drives attached to the internal or external Macintosh SCSI chain or a qualified PCI SCSI accelerator card for audio recording and storage. For 32-track, 24-bit performance at a sample rate of 44.1 kHz, drives must have a sustained transfer rate of 4.04 megabytes per second or faster.
- Pro Tools III requires one or more Digidesign-approved external SCSI drives attached to the Pro Tools Disk I/O SCSI chain for audio recording and storage. Drives must have a sustained transfer rate of 2.5 megabytes per second or faster and an average seek time of 10 milliseconds or less. With Pro Tools III, an external SCSI drive cannot be your computer's Startup drive.

Pro Tools Project and Audiomedia Systems

CPU Requirements:

- A Digidesign-qualified, PCI-based Power Macintosh computer with at least 48 megabytes of RAM. Additional RAM is highly recommended if you plan to use a MIDI sequencer concurrently with Pro Tools. Virtual memory is not supported.
- Apple's System software version 8.0 or higher running in 32-bit mode
- Apple's QuickTime System Extension version 3.0 or higher (included with Pro Tools)
- A 17-inch or larger color monitor. Black and white monitors are not supported.

Hard Drive Requirements:

- Pro Tools Project requires one or more external SCSI drives attached to the Pro Tools Project Disk I/O SCSI chain for audio recording and storage. Drives must have a sustained transfer rate of 2.5 megabytes per second or faster and an average seek time of 10 milliseconds or less. Drives connected to the Disk I/O card cannot be used as Startup drives.
- Pro Tools with Audiomedia systems require internal or external hard drive(s) attached to the Macintosh SCSI bus. Drives must have a sustained transfer rate of 2.5 megabytes per second or faster and an average seek time of 10 milliseconds or less.

Pro Tools with PowerMix

CPU Requirements

- A supported Power Macintosh computer with a 66 MHz or faster processor.
- 48 megabytes of RAM. Additional RAM is recommended if you plan to use a MIDI sequencer concurrently with Pro Tools. You cannot use the Macintosh's Virtual Memory capability with Pro Tools.
- Apple's System software version 8.0 or higher running in 32-bit mode.
- Apple's QuickTime System Extension version 3.0 or higher (included with Pro Tools).
- A 17-inch or larger color monitor. Black and white monitors are not supported.

Hard Drive Requirements

- An internal or external hard drive attached to the Macintosh SCSI bus for installing the Pro Tools software and recording audio. Drives must have a sustained transfer rate of 2.5 megabytes per second or faster and an average seek time of 10 milliseconds or less.

To record and play audio you will also need:

- A stereo audio amplifier and speakers, with cables/adapters to connect to the Power Macintosh's built-in audio connectors for audio input and output.

MIDI Requirements

Pro Tools 4.2 requires version 2.3.2 or higher of Opcode Systems' OMS (Open Music System) for MIDI-related interapplication communication, synchronization to external devices, and support for MIDI interfaces and other MIDI devices.

To use MIDI-related features you will need:

- Opcode Systems' OMS software, version 2.3.2 or higher (included and installed with Pro Tools)
- A Macintosh-compatible MIDI Interface
- A MIDI controller and/or sound modules

Additional Requirements

To record and play audio you will also need:

- A stereo audio amplifier and speakers
- Optionally, a mixing console and sound source. Depending on which system and Audio Interface you are using, this device must be equipped with the appropriate connections. The connections and operating levels for Digidesign Audio Interfaces are as follows:

888/24 I/O

- Analog: XLR (balanced or unbalanced) connectors, +4 dBu or -10 dBV
- Digital: XLR (AES/EBU) or RCA (S/PDIF) connectors

888 I/O

- Analog: XLR (balanced or unbalanced) connectors, +4 dBu or -10 dBV
- Digital: XLR (AES/EBU) or RCA (S/PDIF) connectors

882/20 I/O

- Analog: 1/4" TRS (balanced or unbalanced) connectors, +4 dBu or -10 dBV
- Digital: RCA (S/PDIF) connectors

Audiomedia III

- Analog: RCA (unbalanced) connectors, -10 dBV
- Digital: S/PDIF (RCA) digital connectors

When choosing a hard drive to use for recording, please consult Digidesign hard drive compatibility information. Hard drive manufacturers are not always the best source for information about the speed of their drives. Digidesign has encountered many instances where actual hard drive access and throughput speeds varied considerably from what manufacturers advertise. While some drives not currently on Digidesign's approved list may work with Pro Tools, Digidesign can only assure compatibility with drives that we have tested and approved.

You can obtain Digidesign's latest hard drive compatibility list 24 hours a day from the following sources:

Digidesign Fax On Demand

This is a free service that provides product information and compatibility documents sent directly to your fax number. Simply call 888-873-3444 or 650-842-6602 and follow the recorded instructions. Documents are ordered by index number. You can request an index the first time you call. This service is available 24 hours a day, 7 days a week.

Digidesign Online

Digidesign has both product information and technical support on-line via the World Wide Web. In addition, there are many user forums which Digidesign encourages, but does not sponsor. For the most current, accurate information about Digidesign products, please browse Digidesign-sponsored forums.

World Wide Web: www.digidesign.com

Digidesign FTP Site: ftp.digidesign.com

A Preface to Pro Tools

The last 10 years have seen a radical change in the way that music and sound are recorded. A decade ago, the world of high-fidelity multitrack recording and frame-accurate synchronization belonged primarily to large commercial recording and post-production facilities. An individual was considered lucky to even have access to a professional-quality multitrack tape deck.

The process of taking a music project from concept to completion was time consuming and costly. An idea usually began as a poor-quality demo, and was eventually rerecorded on better equipment in a studio that charged by the hour. After much time and expense, the energy of the original idea was often lost in the rerecording process, while control of the project fell to the outside sources responsible for funding it. In the world of post-production, producing an independent product that matched the quality of high-budget productions was nearly impossible. Accurately spotting audio to picture for a complex broadcast commercial was impossible.

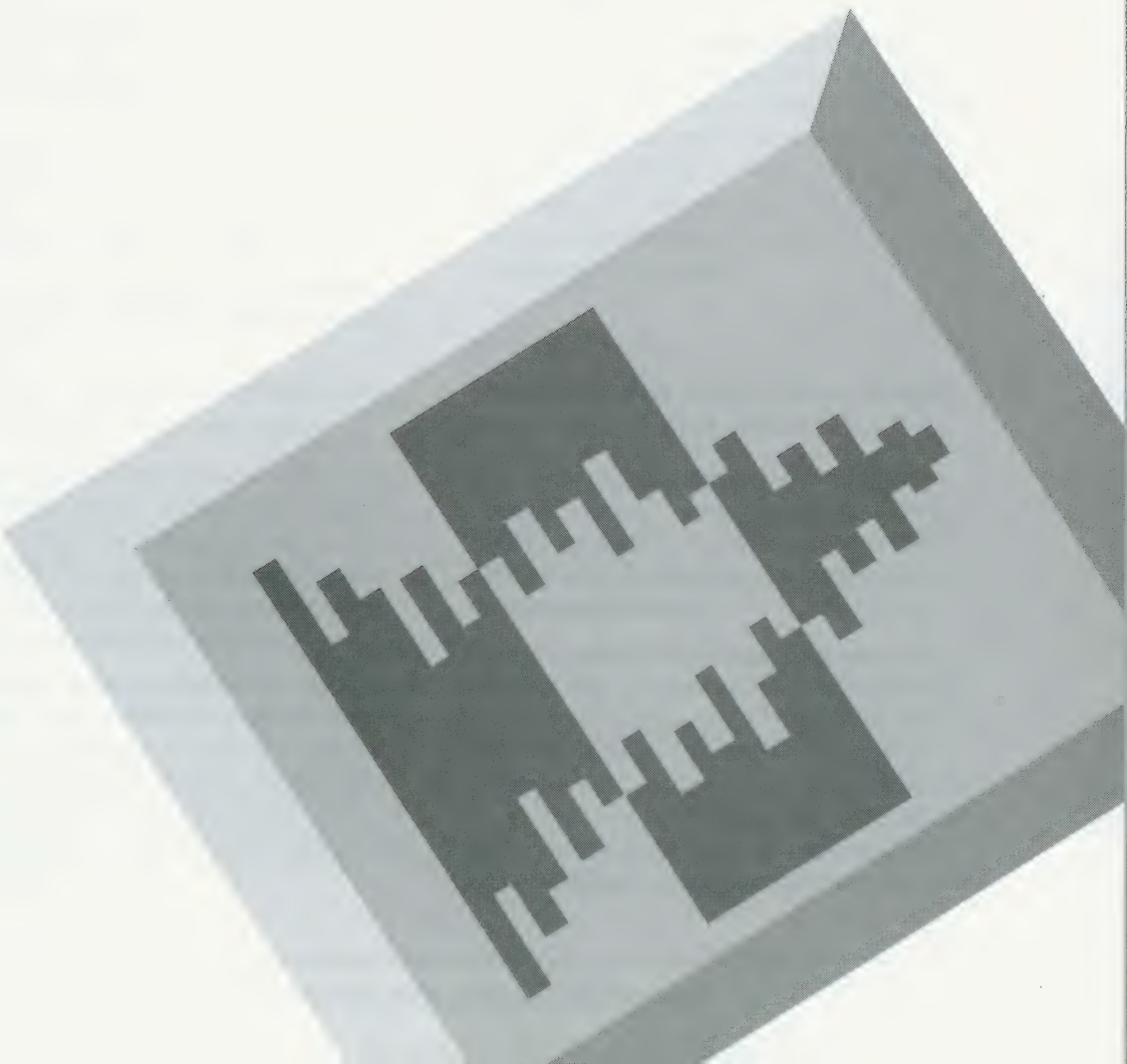
When the MIDI standard was established in 1985, it offered musicians the ability to control the playback of multiple keyboards or drum machines from a single master controller such as a MIDI keyboard or home computer. Soon all synthesizers began to show up with MIDI ports. MIDI solved many problems, but it presented no way to easily integrate acoustic instruments such as guitar or human voice. Then in 1989, Digidesign released the Sound Tools™ system. Sound Tools offered a CD-quality stereo digital recording environment that could capture audio with extremely high fidelity, elevating many home/project studios from demo-quality recording to CD-quality recording. But this still did not solve every problem.

With a Macintosh, musicians and producers could now sequence their sound sources via MIDI and make a digital recording of any audio signal, but the two realms could not easily be combined. Above all, musicians needed a way to play back sequenced MIDI tracks and record multiple digital audio tracks in sync with those MIDI tracks. All of the tracks, both MIDI and audio, need to be integral parts of the recording, mixed to a final digital stereo master for duplication and distribution. The Pro Tools system was created to offer exactly these capabilities.

Pro Tools provides you with the ability to record ideas digitally from the very beginning of your project and gain extraordinary control over the final result. You can arrange and edit your material quickly and easily, trying out any number of creative ideas, and finally, create a fully digital stereo master recording with EQ, effects, and automated mixdown. If you wish, you can transfer your final master digitally to DAT or burn a CD with Digidesign's MasterList CD™ software.

Thanks to Pro Tools, every step in the multitrack production of digital audio is now available in an affordable package.

Installing Pro Tools 24 and Pro Tools III Hardware



Chapter 2

Installing Pro Tools 24 and Pro Tools III Hardware

Introduction

This chapter takes you step by step through the installation of your Pro Tools 24 or Pro Tools III Core System hardware. (If you own a Pro Tools Project or Audiomedia III system, please refer to Chapter 3.)

NOTE: After you finish your Pro Tools 24 or Pro Tools III hardware installation you do not need to refer to Chapter 3 since it deals with installing Pro Tools Project and Audiomedia III systems. Instead, go directly to Chapter 4, where you will learn how to connect hard drives to your system.

In order to get off to the right start, it is important that you follow the instructions in this chapter carefully.

Your installation covers the following steps:

- Installing the d24 card (for Pro Tools 24 systems) or Disk I/O card (for Pro Tools III systems) into your Macintosh
- Installing the DSP Farm card into your Macintosh
- Connecting your Pro Tools Audio Interface

If you have purchased an expanded Pro Tools system (Pro Tools Expansion Kits, additional DSP Farm cards, or additional Audio Interfaces) please read the section entitled "If You Are Installing an Expanded Pro Tools System." There you will find important information about these systems and their installation.

Your Pro Tools hardware and software are easy to install. Depending on your studio setup, installation will probably take about 30 minutes. However, before you jump straight into setting up your system, you may wish to quickly read through the next few sections so that you have a good understanding of what the installation procedure entails.

If You Are Installing an Expanded Pro Tools System

The Pro Tools installation instructions given in this chapter are geared towards installing a Core Pro Tools 24 or Pro Tools III system, which consists of one d24 or Disk I/O Card, one DSP Farm, and your choice of Audio Interface.

If you are installing an expanded Pro Tools 24 or Pro Tools III system (by adding additional Expansion Kits, DSP Farm cards or Audio Interfaces), your installation will be very similar to the installation outlined in this chapter. The difference is that you will be adding more cards and/or Audio Interfaces. At the appropriate steps of your installation, there are instructions that pertain to expanded systems.

Installing Pro Tools Cards in the Correct CPU Slot Order

Before you install the cards for your Pro Tools 24 or Pro Tools III system, it is important that you know the correct order in which to install them. Correct slot order is essential for your system to correctly "clock" the data passing through it.

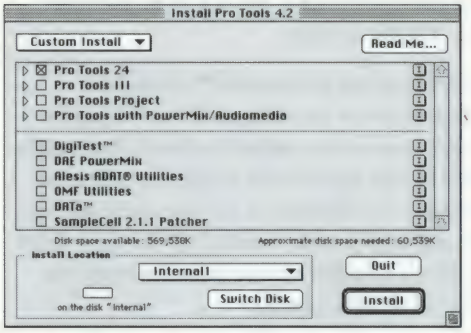
To properly install your Digidesign cards you must begin installing them from the lowest numbered slot in your computer. In most current PCI-equipped Power Macintosh computers, the slots are labeled on the motherboard in this type of numbering scheme: A1, B1, C1, A2, B2, C2, and so on. In this scheme, A1 is the lowest numbered slot, and you should begin installing cards starting there. Typically, the lowest numbered slot

is the one that is located closest to the center of the computer.

Your Pro Tools 4.2 Installer CD-ROM includes a utility called DigiTest which will list the slot order for your particular model of computer.

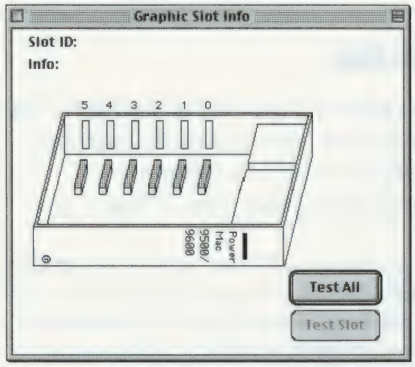
To install and use DigiTest to determine the slot information for your Macintosh:

1. Locate your Pro Tools 4.2 Installer CD-ROM and double-click the file named "Install Pro Tools."
2. When the Installer screen appears, click Continue.



The Pro Tools Installer

3. Click the box next to DigiTest to select it for installation, then select the hard disk on which you wish to install DigiTest using the Switch Disk button. We suggest that you choose your Startup Drive (the drive that contains your System Folder).
4. Click Install.
5. When installation is complete, click Quit to return to the Finder.
6. Locate and open the DigiTest application.
7. When DigiTest opens, it will display a picture of your Macintosh with alphanumeric labels above each of the slots in your model of Macintosh.
8. After you have noted the slot order for your model of Macintosh, choose Quit from the File menu to quit DigiTest.
9. Follow the correct slot order for the installation of your TDM-equipped cards as given below. (In the illustration that follows, slot "0" is the lowest numbered slot since "0" comes before "1" or "2.")



DigiTest displays slot order information for your computer

Installing Cards in the Computer

Install your cards in your computer in the following order, starting with the lowest alphanumeric slot:

Card order for Pro Tools 24:

1. The display card for your computer monitor (if required)
2. Pro Tools d24 cards
3. DSP Farm cards
4. SampleCell II TDM cards (if you have any)
5. SCSI accelerator cards (if you are using any)
6. Video capture cards (if you are using any)

SCSI accelerator cards are not supported in 3-slot computers running Pro Tools 24 systems.

If you are using a Pro Tools 24 system in a 6-slot computer with a SCSI accelerator card or a video capture card, the d24 card must go in one of the first (top) three PCI slots. The SCSI accelerator or video capture card

must go in one of the last (bottom) three PCI slots. It is essential that the d24 card and any SCSI accelerator or video capture cards reside in different banks of PCI slots.

In addition, if you are using an expansion chassis to add additional PCI slots to your computer, the expansion chassis card must go in the first PCI slot inside your computer. All Digidesign cards must then reside in the expansion chassis. SCSI accelerator cards and video capture cards must reside in one of the Macintosh's last 3 PCI slots.

Card order for Pro Tools III:

1. The display card for your computer monitor (if required)
2. Video capture cards or SCSI accelerator cards (if you are using any)
3. Disk I/O cards
4. DSP Farm cards
5. SampleCell II TDM cards (if you have any)

For both Pro Tools 24 and Pro Tools III systems, if you have more than one d24, Disk I/O, DSP Farm, or SampleCell II TDM card in your system, you should install the same card type together in successive slots. In other words, install the d24 or Disk I/O cards together in successive slots, the DSP Farm cards in the following successive slots, and then the SampleCell II TDM cards.

If you have additional PCI cards that are not TDM-equipped (such as Digidesign's Audiomedia III), install those cards in the slots following the TDM-equipped cards. Do not install non-TDM cards or leave empty slots in between TDM-equipped d24, Disk I/O, DSP Farm, or SampleCell II cards.

Installing a Pro Tools 24 Expansion Kit

Pro Tools 24 Expanded Systems without an Expansion Chassis

With Pro Tools 24, it is possible to install two d24 cards and two DSP Farms in certain 6-slot Macintosh computers. For maximum track count, a Digidesign-approved SCSI accelerator card is required with this configuration.

When installing an expanded system, it is important that you install your Pro Tools cards in the correct order in your computer. Correct slot order is essential for your system to yield maximum track count and reliable performance. To properly install your Digidesign cards you must begin installing them from the lowest numbered slot in your computer. In Power Macintosh 9600 models, the lowest numbered slot is the one that is located closest to the center of the computer (nearest the power supply).

Install your cards in your computer in the following order, starting with the lowest alphanumeric slot:

Slot 0. Video Monitor Card (required in Power Macintosh 9600 systems)

Slot 1. Pro Tools d24 card

Slot 2. Pro Tools d 24 card

Slot 3. Pro Tools PCI DSP Farm

Slot 4. Pro Tools PCI DSP Farm

Slot 5. SCSI Accelerator Card (required for maximum track count)

Pro Tools 24 Expanded Systems with an Expansion Chassis

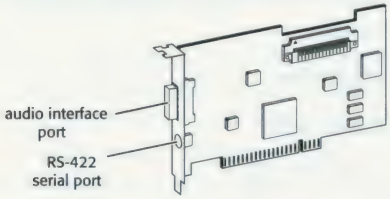
For more DSP power, you can also expand your Pro Tools 24 system using a Digidesign-approved Expansion Chassis. Consult the PCI Expansion Chassis Installation Guide included with your Pro Tools 24 system for

instructions on connecting an Expansion Chassis and installing cards in the proper order.

For the latest compatibility information on expanded Pro Tools 24 systems, contact your Digidesign dealer, your local Digidesign office, or visit Digidesign's website at www.digidesign.com.

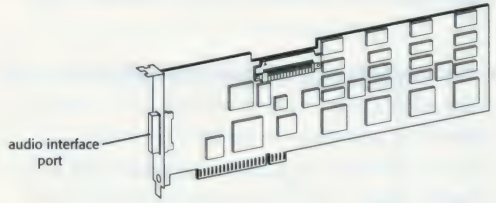
Installing the Pro Tools 24 System Hardware

Your Pro Tools 24 Core System hardware consists of two PCI cards and a 5-node TDM ribbon cable. The appropriate I/O peripheral cable for connecting the d24 card to your Audio Interface is included with your Audio Interface. If you wish to connect a second Audio Interface to your system, you can either attach it to the DSP Farm card, or purchase an optional 16-channel interface adapter cable and attach both Audio Interfaces to the d24 card. The adapter cable is available from your authorized Digidesign reseller.



The d24 Card

The d24 card provides 24-bit, 24-track, 16-channel I/O, direct-to-disk recording and playback capabilities to your Pro Tools 24 system. It also provides a connector for attaching an Audio Interface. (By purchasing a separate interface adapter cable, two 8-channel Audio Interfaces can be connected to the d24 card.)



The DSP Farm

The DSP Farm provides the raw horsepower for your Pro Tools 24 system's mixing and processing capabilities. It powers DSP software Plug-Ins such as the EQ, Dynamics, Dither, and other Plug-Ins included with your system. It also provides a connector for attaching an 8-channel Audio Interface.

The TDM Ribbon Cable

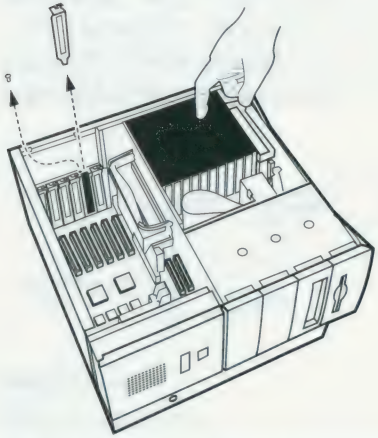
The TDM ribbon cable is used to physically connect the cards in your Pro Tools 24 system together so that they can share audio data along the TDM Bus. Your system includes a 5-node TDM cable. If you plan to expand your system using a third-party PCI expansion chassis, you will need a longer TDM cable, which you can order from your Digidesign dealer.

To install the Pro Tools 24 cards:

1. Make sure your Macintosh is turned off. Leave it plugged in so that it is grounded.
2. Remove the Macintosh's cover. The illustrations shown here depict installation in a Power Macintosh 9600-model computer. Your installation should be very similar. If you are unsure how to open and

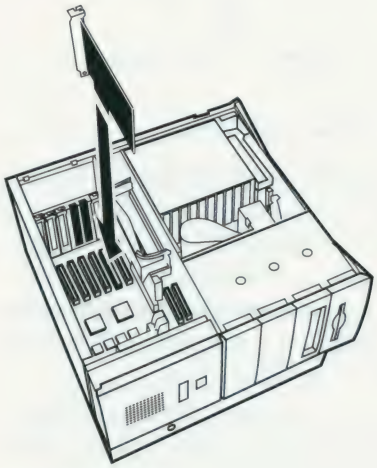
install a card in your particular model of computer, please refer to its User's Guide.

3. Before handling the d24 card, DSP Farm, or other cards, discharge any static electricity that may be on your clothes or body by touching a grounded metal surface, such as the power supply case inside your computer.
4. To make installation easier, you may wish to remove any PCI cards currently installed in your Macintosh. This will give you extra room to maneuver inside your CPU.
5. Remove the metal access port cover behind the expansion slot you wish to use by removing the screw (if present) and sliding the cover out from the access port. If necessary, lower the auxiliary fan which covers the PCI slots inside Power Macintosh models such as the 9500.



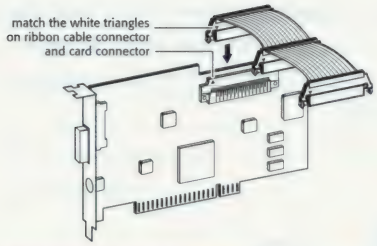
Discharging residual static electricity and removing an access port cover

6. Remove the d24 card from its protective antistatic bag. Handling it carefully, so as not to damage its sensitive components, align the d24 card with the appropriate expansion slot (refer to the guidelines given earlier) and plug it in. To do this, slide the card between the levers on either side of the access port and push the card firmly but gently into the PCI connector until it is properly seated. It will click into place when properly seated. Avoid flexing the card or putting undue pressure on your computer's motherboard.



Installing the d24 card

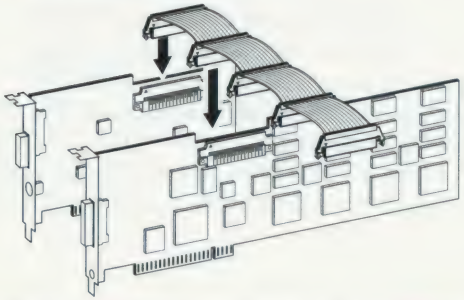
7. Next, unpack the DSP Farm card and remove it from its antistatic bag, observing the same precautions as before.
8. Plug the DSP Farm into the PCI slot adjacent to your d24 card.
9. Connect your d24 and DSP Farm cards with the TDM ribbon cable. To do this, connect the first node of the cable to your d24 card (as described in steps 10 and 11). Then, using the same technique, attach the second node on the cable to the DSP Farm, and so on, until you have connected all of your Pro Tools 24 cards.



Attaching the TDM ribbon cable

10. To attach the TDM ribbon cable, first make sure that it is turned the right direction before you attempt to insert it in the connector. There are white triangles on the plugs of the TDM ribbon cable and on the TDM connectors on your d24 and DSP Farm cards. Match these triangles to make sure the TDM ribbon cable is turned the right direction.

11. Push down gently but firmly until the node is fully connected to the card. Try not to force this connection or you could damage the connector. If you meet a lot of resistance, pull the cable out and try again. When the plug is properly seated, the two tabs on the side of the ribbon cable's TDM connector will click shut. If you wish to detach the ribbon cable, squeeze the tabs on the TDM connector inward. It is acceptable if you have ribbon connectors that go unused. These should reside after the last Pro Tools card.



Attaching the TDM ribbon cable to the d24 and DSP Farm cards

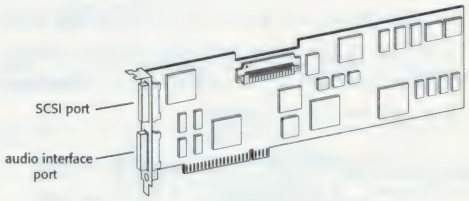
12. If you have an expanded Pro Tools 24 system with additional d24 or DSP Farm cards, repeat the previous steps as necessary. Make sure that you follow the correct slot order (group similar cards together) and that all Pro Tools cards in your system are properly connected with the TDM ribbon cable.

13. After you have connected all of your Pro Tools cards with the TDM ribbon cable, secure the cards in place with the slot access port screw you removed earlier and put the cover back on your Macintosh. If your computer has an auxiliary fan (as does the Power Macintosh 9500) snap it back into place before replacing the cover. If the fan will not snap back into place, or if you meet resistance when you try to do so, confirm that the Pro Tools cards are seated properly and try again.

This completes your Pro Tools 24 card installation. You can skip the next section (which explains card installation for Pro Tools III systems) and refer instead to the section entitled "Connecting Your Audio Interface" to learn how to install and connect your Audio Interface.

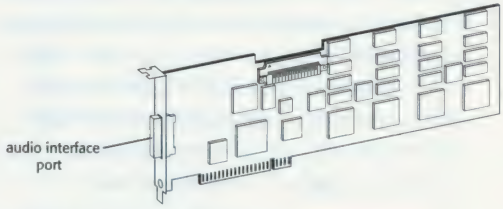
Installing the Pro Tools III Core System Hardware

Your Pro Tools III Core System hardware consists of two PCI cards, one custom Disk I/O-to-SCSI cable, and a 5-node TDM ribbon cable. An I/O peripheral cable is included with your Audio Interface.



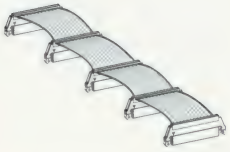
The Disk I/O Card

The Disk I/O card provides the 16-bit, 16-track, 8-channel I/O, direct-to-disk recording and playback capabilities of your system. It also provides a connector for attaching a SCSI hard drive and an I/O connector for attaching an 8-channel Audio Interface.



The DSP Farm

The DSP Farm provides the raw horsepower for your Pro Tools III system's mixing capabilities and enables it to run TDM software Plug-Ins (such as the EQs, Dynamics, Dither, and Time Domain Plug-Ins included with your system). It also provides a connector for attaching an 8-channel Audio Interface.

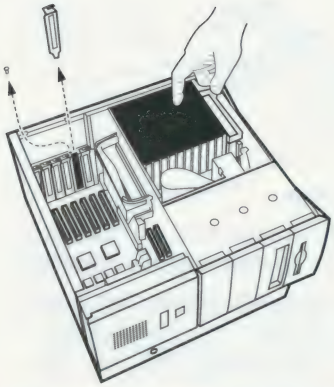


The TDM Ribbon Cable

The TDM ribbon cable is used to physically connect the cards in your Pro Tools III system together so that they can share audio data along the TDM Bus. Your system includes a 5-node TDM cable. If you plan to expand your system, you will need a longer TDM cable, which you can order from your dealer.

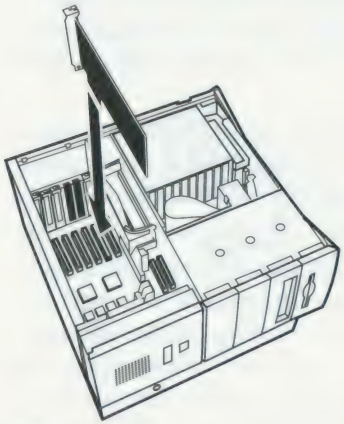
To install the Pro Tools III cards:

1. Make sure your Macintosh is turned off. Leave it plugged in so that it is grounded.
2. Remove the Macintosh's cover. The illustrations shown here depict installation in a Power Macintosh 9600-model computer. Your installation should be very similar. If you are unsure about how to open and install a card in your particular model of Macintosh, please refer to your Macintosh User's Guide.
3. Before handling the Disk I/O card, DSP Farm, or other cards, discharge any static electricity that may be on your clothes or body by touching a grounded metal surface, such as the power supply case inside your Macintosh.
4. To make installation easier, you may wish to remove any PCI cards currently installed in your Macintosh. This will give you extra room to maneuver inside your CPU.
5. Remove the metal access port cover behind the expansion slot you wish to use by removing the screw (if present) and sliding the cover out from the access port. If necessary, lower the auxiliary fan which covers the PCI slots inside Power Macintosh models such as the 9500.



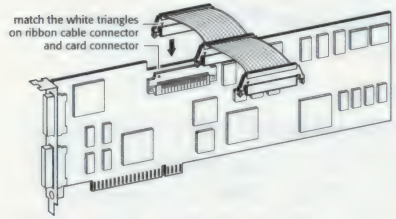
Discharging residual static electricity and removing an access port cover

6. Remove the Disk I/O card from its protective antistatic bag. Handling it carefully, so as not to damage its sensitive components, align the Disk I/O card with the lowest-numbered expansion slot and plug it in. To do this, slide the card between the levers on either side of the access port and push the card firmly but gently into the PCI connector until it is properly seated. It will click into place when properly seated. Avoid flexing the card or putting undue pressure on your computer's motherboard.



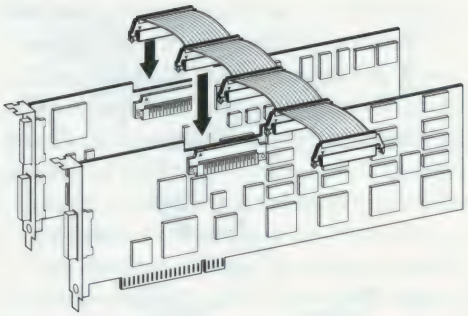
Installing the Disk I/O card

7. Next, unpack the DSP Farm card and remove it from its antistatic bag, observing the same precautions as before.
8. Plug the DSP Farm into the PCI slot adjacent to your Disk I/O card.
9. Connect your Disk I/O and DSP Farm cards with the TDM ribbon cable. To do this, connect the first node of the cable to your Disk I/O card (as described in steps 10 and 11). Then, using the same technique, attach the second node on the cable to the DSP Farm, and so on, until you have connected all of your Pro Tools III cards.



Attaching the TDM ribbon cable

10. To attach the TDM ribbon cable, first make sure that it is turned the right direction before you attempt to insert it in the connector. There are white triangles on the plugs of the TDM ribbon cable and on the TDM connectors on your Disk I/O and DSP Farm cards. Match these triangles to make sure the TDM ribbon cable is turned the right direction.
11. Push down gently but firmly until the node is fully connected to the card. Try not to force this connection. If you meet a lot of resistance, pull the cable out and try again. When the plug is properly seated, the two tabs on the side of the ribbon cable's TDM connector will click shut. To detach the ribbon cable, squeeze the tabs on the TDM connector inward. It is acceptable to have ribbon connectors that go unused. These should reside after the last Pro Tools III card.



Attaching the TDM ribbon cable to the Disk I/O and DSP Farm cards

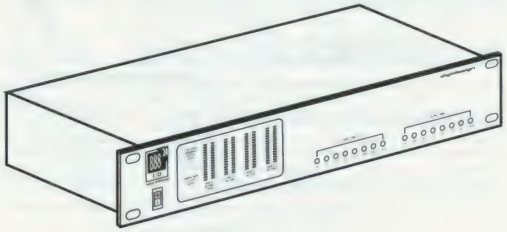
12. If you have an expanded Pro Tools III system with additional Disk I/Os or DSP Farm cards, repeat the previous steps as necessary. Make sure that you follow the correct slot order (group similar cards together) and that all Pro Tools III cards in your system are properly connected with the TDM ribbon cable.

13. After you have connected all of your Pro Tools cards with the TDM ribbon cable, secure the cards in place with the slot access port screw you removed earlier and put the cover back on your Macintosh. If your computer has an auxiliary fan (as does the Power Macintosh 9500) snap it back into place before replacing the cover. If the fan will not snap back into place, or if you meet resistance when you try to do so, confirm that the Pro Tools cards are seated properly and try again.

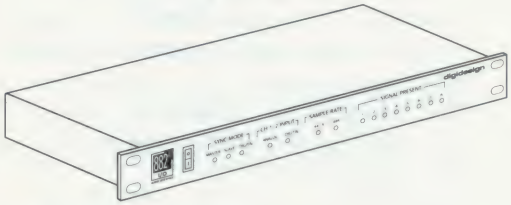
This completes your Pro Tools III card installation. Please refer to the next section to learn how to install and connect your Audio Interface.

Connecting Your Audio Interface (Pro Tools 24 Systems)

Your Pro Tools 24 system provides you with a choice of the 888/24 I/O or 882/20 I/O Audio Interface. These devices supply the inputs and outputs for your system. Though the specific features of these interfaces differ, their installation is virtually identical.



The 888/24 I/O Audio Interface

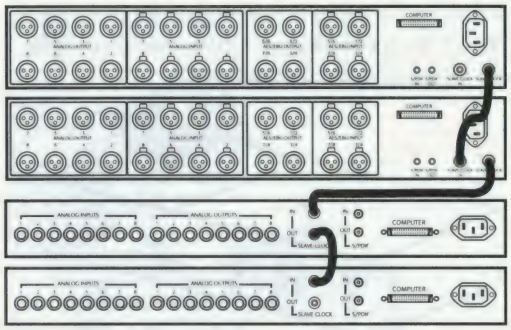


The 882/20 I/O Audio Interface

To connect the Audio Interface:

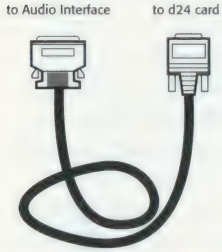
1. Carefully unpack the Audio Interface. Depending on how your studio is set up, you may wish to make audio and power connections before you mount the Audio Interface in your rack. The 888/24 I/O is a standard 19", two-rack space device. The 882/20 I/O is a standard 19", one-rack space device. Rack screws are included with your Audio Interface.

2. If you are using two or more Audio Interfaces with your Pro Tools 24 system, connect them together at the Slave Clock In/Out ports using the enclosed BNC cables as shown in the illustration that follows. The "master" Audio Interface should be connected to the d24 card that resides in the lowest alphanumeric slot in your Macintosh. (If you connect two Audio Interfaces to a d24 card using the optional Y-adapter cable, the master interface is the one connected to the cable labeled "Interface A.")

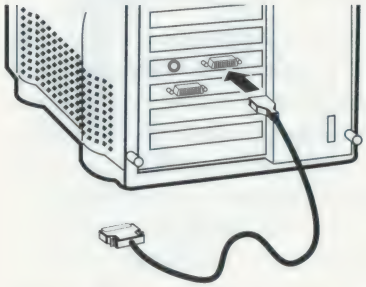


Connecting multiple Audio Interfaces together

3. Connect the interface cable to the d24 card as shown in the illustration that follows. Gently push the cable's connector into the card's interface port and secure the connector in place with its thumbscrews. Make sure that this connection is secure. Loose cables can cause problems with your Pro Tools system.

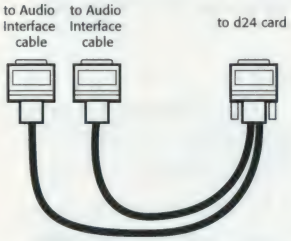


The Audio Interface cable

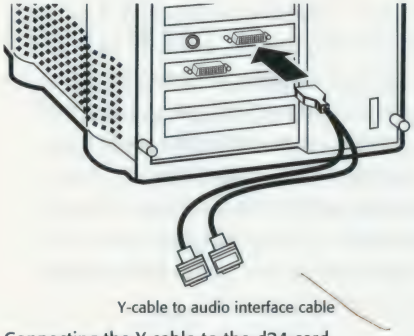


Connecting the interface cable to the d24 card

4. If you have two 8-channel Audio Interfaces and wish to connect both of them to the d24 card, you may do so by purchasing and using Digidesign's audio interface Y-cable adapter. Connect the single end of the Y-cable to the d24 card as shown in the illustration that follows. Gently push the cable's connector into the card's interface port and secure the connector in place with its thumbscrews. Make sure that this connection is secure. Loose cables can cause problems with your Pro Tools system.

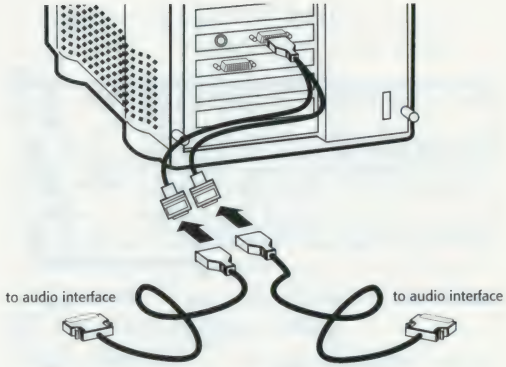


The optional Pro Tools 24 Y-cable adapter



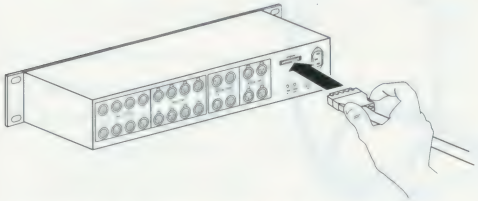
Connecting the Y-cable to the d24 card

5. Connect the other ends of the Y-cable to the Audio Interface cables. (The Y portion of the cable is labeled "Interface A" and "Interface B" for reference.)

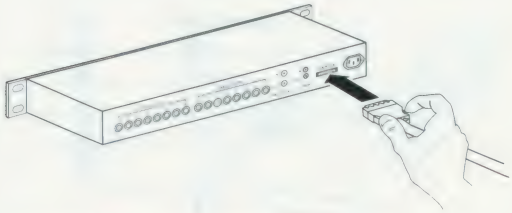


Connecting the Y-cable to the Audio Interface cables

6. Connect the Audio Interface cable to the back of the Audio Interface. (If you have two interfaces and the optional Y-adapter, connect each cable to an interface.) To do this, pinch the metal tabs on either side of the metal connector and push it into the port labeled "Computer" on the rear of the Audio Interface. Release pressure on the metal tab to lock the connector into place. Please be careful when connecting this cable. You can bend the pins on the connector if you apply too much force.

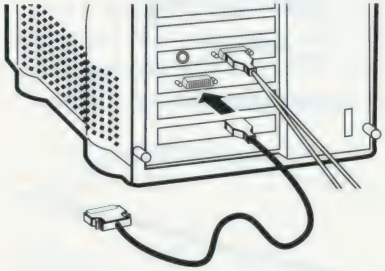


Connecting the Interface cable to the 888/24 I/O



Connecting the interface cable to the 882/20 I/O

7. Because Pro Tools 24 Core systems support up to 24 channels of input and output, you can connect a third 8-channel Audio Interface to the I/O connector on the DSP Farm card, as shown in the following illustration.



Connecting an additional Audio Interface

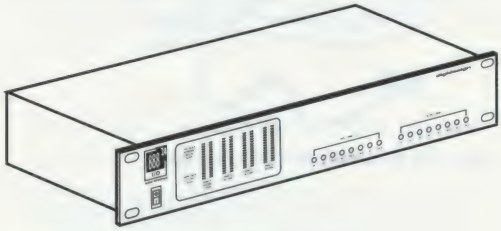
8. If you have an expanded Pro Tools 24 system with additional Audio Interfaces, d24 cards, or DSP Farms, connect additional Audio Interfaces to corresponding d24 or DSP Farm cards with the interface cables. Please remember that your primary Audio Interface must be connected to the first d24 card in your CPU (the one in the lowest alphanumeric slot). The primary d24 card will function as the clock master in your system.
9. Finally, connect the power cable to the rear of your Audio Interface(s). The Audio Interface automatically selects the power setting for use with the standard voltage and frequency in any country. Simply connect the power cable appropriate to your local power standard and the Audio Interface will function normally.

You'll learn how to connect instruments and effects devices to the Audio Interface in Chapter 5, "Connecting Your Studio."

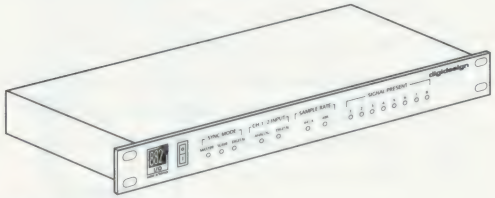
You can skip the section that follows this, since it applies only to Pro Tools III systems. Instead, turn directly to Chapter 4 where you will learn how to connect a SCSI hard drive to your system.

Connecting Your Audio Interface (Pro Tools III Systems)

Your Pro Tools III system provides you with a choice of the 888/24 I/O or 882/20 I/O Audio Interface. These devices supply the inputs and outputs for your system. Though the specific features of these interfaces differ, their installation is virtually identical.



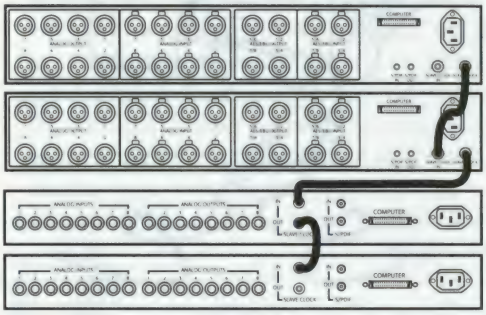
The 888/24 I/O Audio Interface



The 882/20 I/O Audio Interface

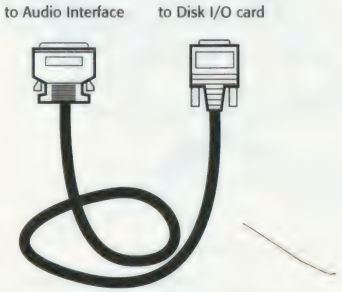
To connect the Audio Interface:

1. Carefully unpack the Audio Interface. Depending on how your studio is set up, you may wish to make audio and power connections before you mount the Audio Interface in your rack. The 888/24 I/O is a standard 19", two-rack space device. The 882/20 I/O is a standard 19", one-rack space device. Rack screws are included with your Audio Interface.
2. If you are using two or more Audio Interfaces with your Pro Tools III system, connect them together at the Slave Clock In/Out ports using the enclosed BNC cables as shown in the illustration that follows. The "master" Audio Interface should be connected to the Disk I/O card that resides in the lowest numeric slot in your Macintosh.

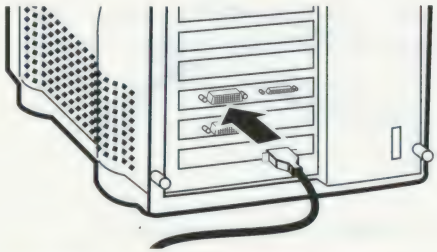


Connecting multiple Audio Interfaces together

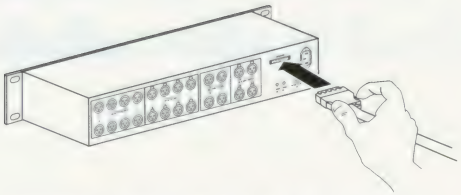
3. Connect the included interface cable to the Disk I/O card as shown in the illustration that follows. Gently push the cable's metal connector into the card's interface port and secure the connector in place with its thumbscrews. Make sure that this connection is secure. Loose cables can cause problems with your Pro Tools system.



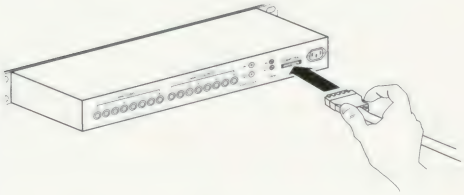
The Pro Tools III audio interface I/O cable



Connecting the I/O cable to the Disk I/O card

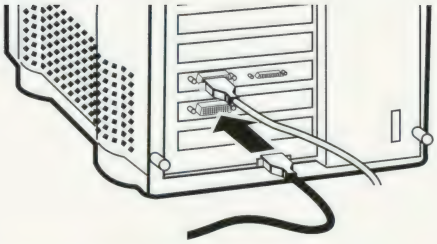


Connecting the interface cable to the 888/24 I/O



Connecting the interface cable to the 882/20 I/O

4. Connect the other end of the interface cable from the Disk I/O card to the back of the Audio Interface. To do this, pinch the metal tabs on either side of the metal connector and push it into the port labeled "Computer" on the rear of the Audio Interface. Release pressure on the metal tab to lock the connector into place. Please be careful when connecting this cable. You can bend the pins on the connector if you apply too much force.
5. If you have an expanded Pro Tools III system with additional Audio Interfaces, Disk I/O cards, or DSP Farms, connect each additional Audio Interface to a corresponding Disk I/O or DSP Farm card with the included interface cables. Your primary Audio Interface must be connected to the first Disk I/O card in your CPU (the one in the lowest numeric slot). The primary Disk I/O card will function as the clock master in your system. Since both the Disk I/O and DSP Farm cards contain a connector for attaching an Audio Interface, you can connect additional Audio Interfaces to either of these cards.

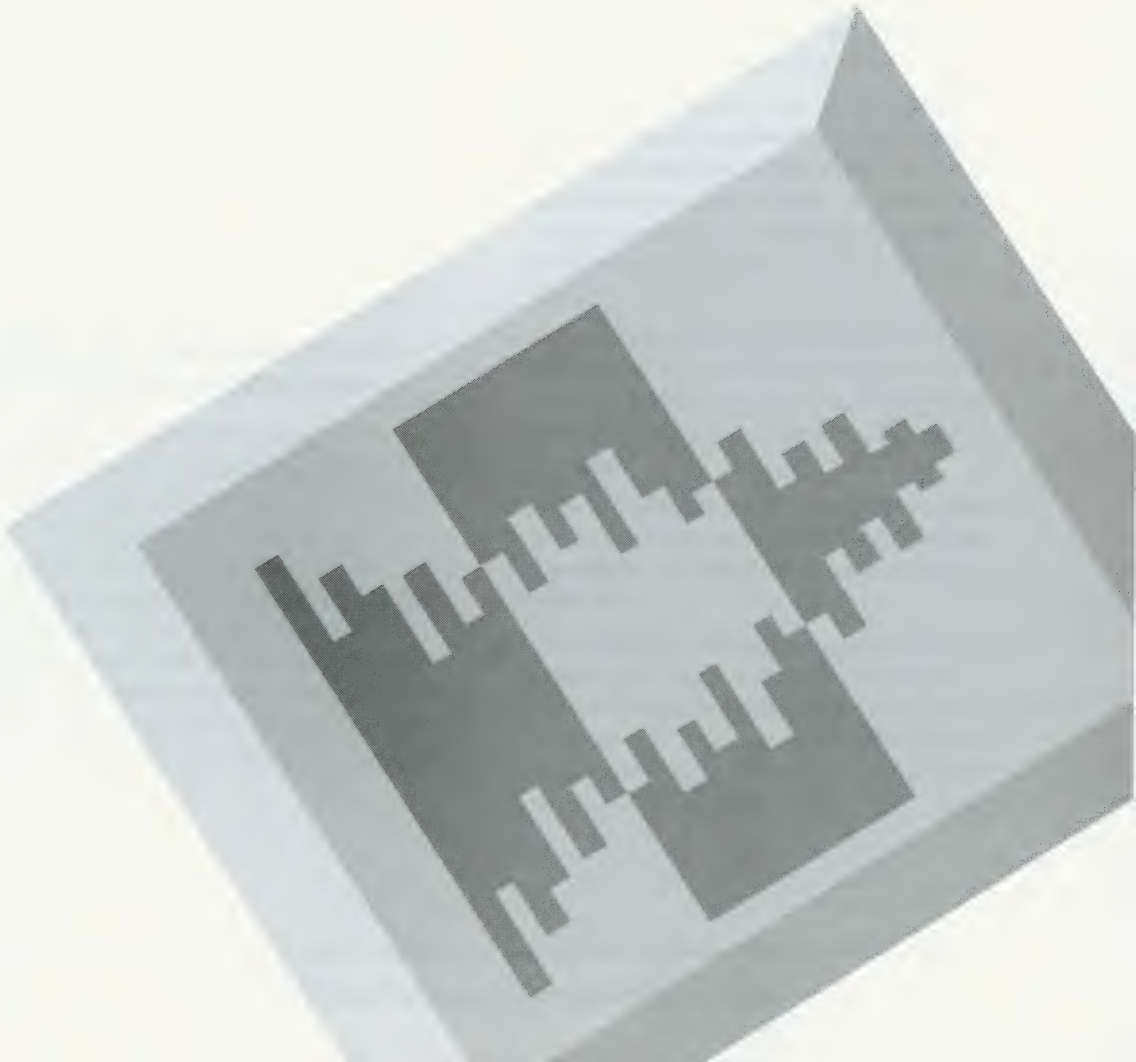


Connecting an additional Audio Interface

6. Finally, connect the power cable to the rear of your Audio Interface(s). The Audio Interface automatically selects the power setting for use with the standard voltage and frequency in any country. Simply connect the power cable appropriate to your local power standard and the Audio Interface will function normally.

Please turn directly to Chapter 4 to learn how to connect SCSI hard drives to your Pro Tools system.

Installing Pro Tools Project and Audiomedia III Hardware



Chapter 3

Installing Pro Tools Project and Audiomedia III Hardware

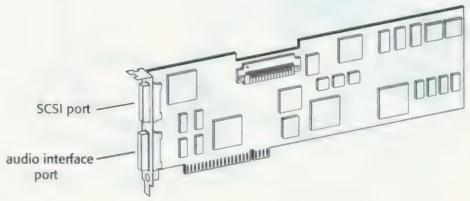
Introduction

This chapter takes you step by step through the installation of your Pro Tools Project or Audiomedia III-based system hardware. (If you own a Pro Tools 24 or Pro Tools III system, please refer to Chapter 2.)

In order to get off to the right start, it is important that you follow the instructions in this chapter carefully. Your Pro Tools hardware and software are easy to install. Depending on your studio setup, installation will probably take about 30 minutes. However, before you jump straight into setting up your system, you may wish to quickly read through the next few sections so that you have a good understanding of what the installation procedure entails.

Installing the Pro Tools Project Audio Card in Your Macintosh

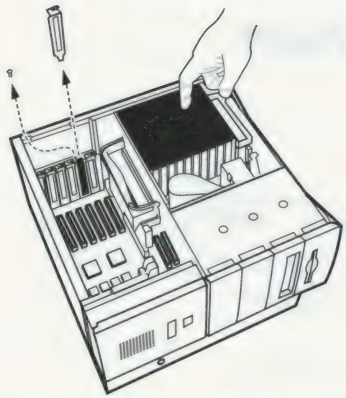
The Pro Tools Project audio card provides the 8-track direct-to-disk recording and playback capabilities of your Pro Tools system. It also provides a connector for attaching a SCSI hard drive and an I/O connector for attaching an 8-channel Digidesign Audio Interface. The Pro Tools Project Audio Card is packaged inside a special antistatic bag that prevents static electricity from damaging its sensitive electronic components. Before handling it, always discharge any static electricity that may be on your clothes or body by touching a grounded metal surface such as the computer's power supply case.



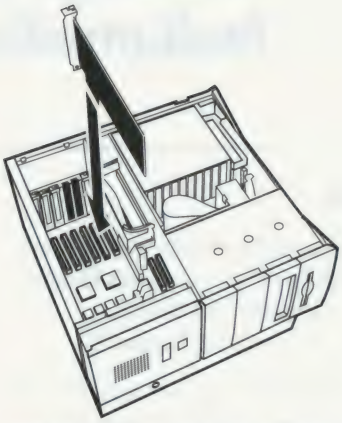
The Pro Tools Project Audio Card

Before you begin:

1. Make sure your Macintosh is turned off. Leave it plugged in so that it is grounded.
2. Remove the Macintosh's cover. The illustrations shown here depict installation in a typical Power Macintosh 9600-model computer; your installation should be very similar. If you are unsure about how to open and install a card in your particular model of Macintosh, please refer to your Macintosh User's Guide.
3. Before handling the Pro Tools Project Audio Card, discharge any static electricity that may be on your clothes or body by touching a grounded metal surface, such as the power supply case inside your Macintosh.
4. To make installation easier, you may wish to remove any PCI cards currently installed in your Macintosh. This will give you extra room to maneuver inside your CPU.
5. Remove the metal access port cover behind the expansion slot you wish to use by removing the screw (if present) and sliding the cover out from the access port. If necessary, lower the auxiliary fan which covers the PCI slots inside Power Macintosh models such as the 9500.



Discharging residual statis electricity and removing a port access cover

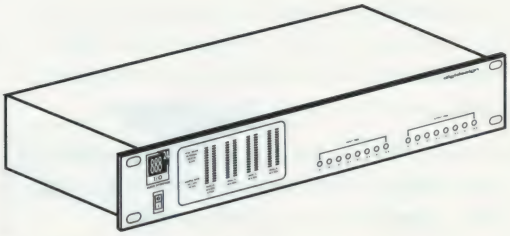


Installing the Pro Tools Project Audio Card

6. Remove the Pro Tools Project Audio Card from its protective antistatic bag. Handling it carefully, so as not to damage its sensitive components, align the Pro Tools Project Audio Card with the lowest-numbered expansion slot (typically, the slot nearest the center of the computer) and plug it in. To do this, slide the card between the levers that held the access port cover you removed earlier, and guide the card's PCI connector towards the slot. Make sure that the card engages the card guide inside the computer, then push the card firmly but gently into the PCI connector until it is properly seated. It will click into place when properly seated. Avoid flexing the card or putting undue pressure on your computer's motherboard.
7. After you have installed the card, snap your Macintosh's auxiliary fan back into place (if one is present on your model), and put the cover back on your Macintosh.
8. This completes your Pro Tools Project Audio Card installation. Please refer to the next section to learn how to install and connect your Audio Interface.

Connecting Your Audio Interface (Pro Tools Project Systems)

Your Pro Tools Project system provides you with a choice of interfaces for your system. You can use either the 888/24 I/O or 882 I/O Audio Interface. These devices supply the inputs and outputs for your system. Though the specific features of these interfaces differ, their installation is virtually identical.

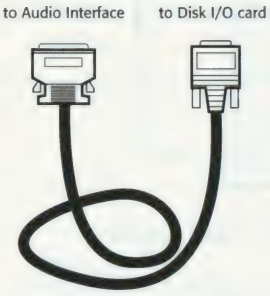


The 888/24 I/O Audio Interface

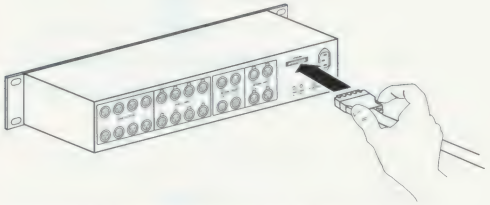
The 882/20 I/O Audio Interface

To connect the Audio Interface:

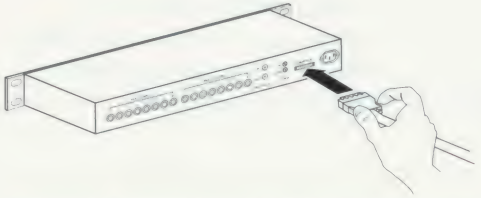
1. Carefully unpack the Audio Interface. Depending on how your studio is set up, you may wish to make audio and power connections before you mount the Audio Interface in your rack. The 888/24 I/O is a standard 19", two-rack space device. The 882/20 I/O is a standard 19", one-rack space device. Rack screws are included with your Audio Interface.
2. Connect the Pro Tools Project Audio Card to the back of the Audio Interface with the included interface cable. To do this, pinch the metal tabs on either side of the metal connector and push it into the port labeled "Computer" on the rear of the Audio Interface. Release pressure on the metal tab to lock the connector into place. Please be careful when connecting this cable. You can bend the pins on the connector if you apply too much force.



The audio interface I/O cable

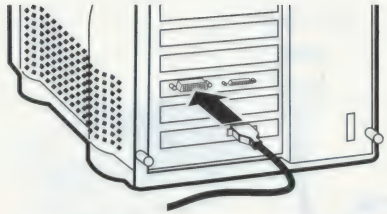


Connecting the interface cable to the 888/24 I/O



Connecting the interface cable to the 882/20 I/O

3. Connect the other end of the I/O cable to the Pro Tools Project Audio Card as shown in the illustration. Push the cable's metal connector into the card's interface port and secure the connector firmly in place with its thumbscrews. Make sure that this connection is secure. Loose cables can cause problems with your Pro Tools system.



Connecting the I/O cable to the Project Audio card

4. Finally, connect the power cable to the rear of your Audio Interface(s). The Audio Interface automatically selects the power setting for use with the standard voltage and frequency in any country. Simply connect the power cable appropriate to your local power standard and the Audio Interface will function normally.

You'll learn how to connect instruments and effects devices to the Audio Interface in Chapter 5, Connecting Your Studio.

You can skip the section that follows this, since it applies only to Audiomedia III-based systems. Instead, turn directly to Chapter 4 where you will learn how to connect a SCSI hard drive to your system.

Installing an Audiomedia III Card

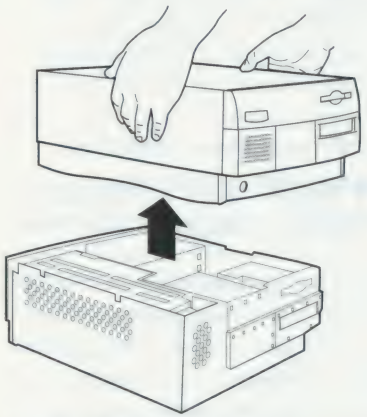
If you own a Digidesign Audiomedia III card, you can run Pro Tools using the DSP power of Audiomedia III. In this case, Pro Tools provides stereo recording and playback of 8 internal tracks of audio.

As a Power Macintosh user, you can take advantage of the Audiomedia III's high fidelity 18-bit analog (24-bit digital) input and output capabilities, and then switch the Pro Tools Playback Engine to PowerMix to obtain up to 16 tracks of simultaneous playback. Depending on the speed of your particular Power Macintosh computer, you can achieve 8, 12 or 16 playback tracks when running Pro Tools with PowerMix as the Playback Engine. However, when you use the PowerMix Engine you will not be able to use your Audiomedia III card's inputs or outputs. Inputs and outputs are available through the Power Macintosh's built-in audio connectors only when you use the PowerMix Engine.

The Audiomedia III card is packaged inside a special antistatic bag that prevents static electricity from damaging its sensitive electronic components.

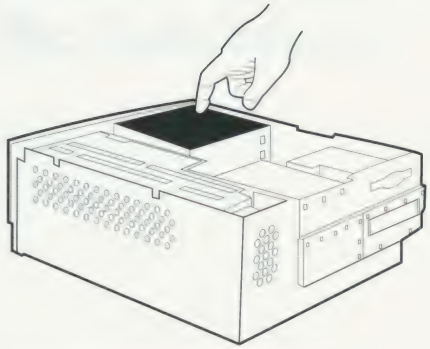
To install the Audiomedia III card in your computer:

1. Make sure your computer is turned off. Leave it plugged in so that it is grounded.
2. Remove your computer's top cover. The illustrations shown in this section depicts installation in a Power Macintosh G3. Your installation should be very similar. If you are unsure how to open and install a card in your particular model of computer, please refer to your computer's User's Guide before going any further.



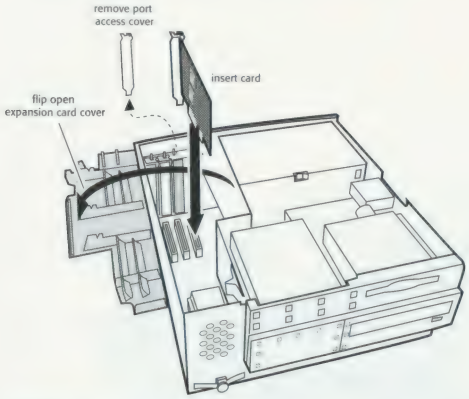
Removing the Macintosh's top cover

3. Before handling the Audiomedia III card, discharge any static electricity that may be on your clothes or body by touching a grounded metal surface such as the power supply case inside your Macintosh.



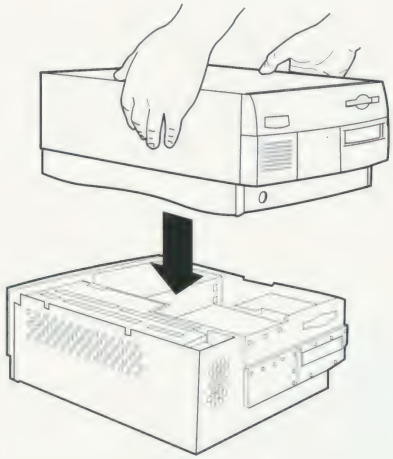
Discharging residual static electricity

4. Flip open the expansion card cover inside your Macintosh to expose its PCI expansion slots.
5. Carefully remove the port access cover of the PCI expansion slot that you wish to use. (The Audiomedia III card can be installed in any of the PCI expansion slots in your Macintosh.)



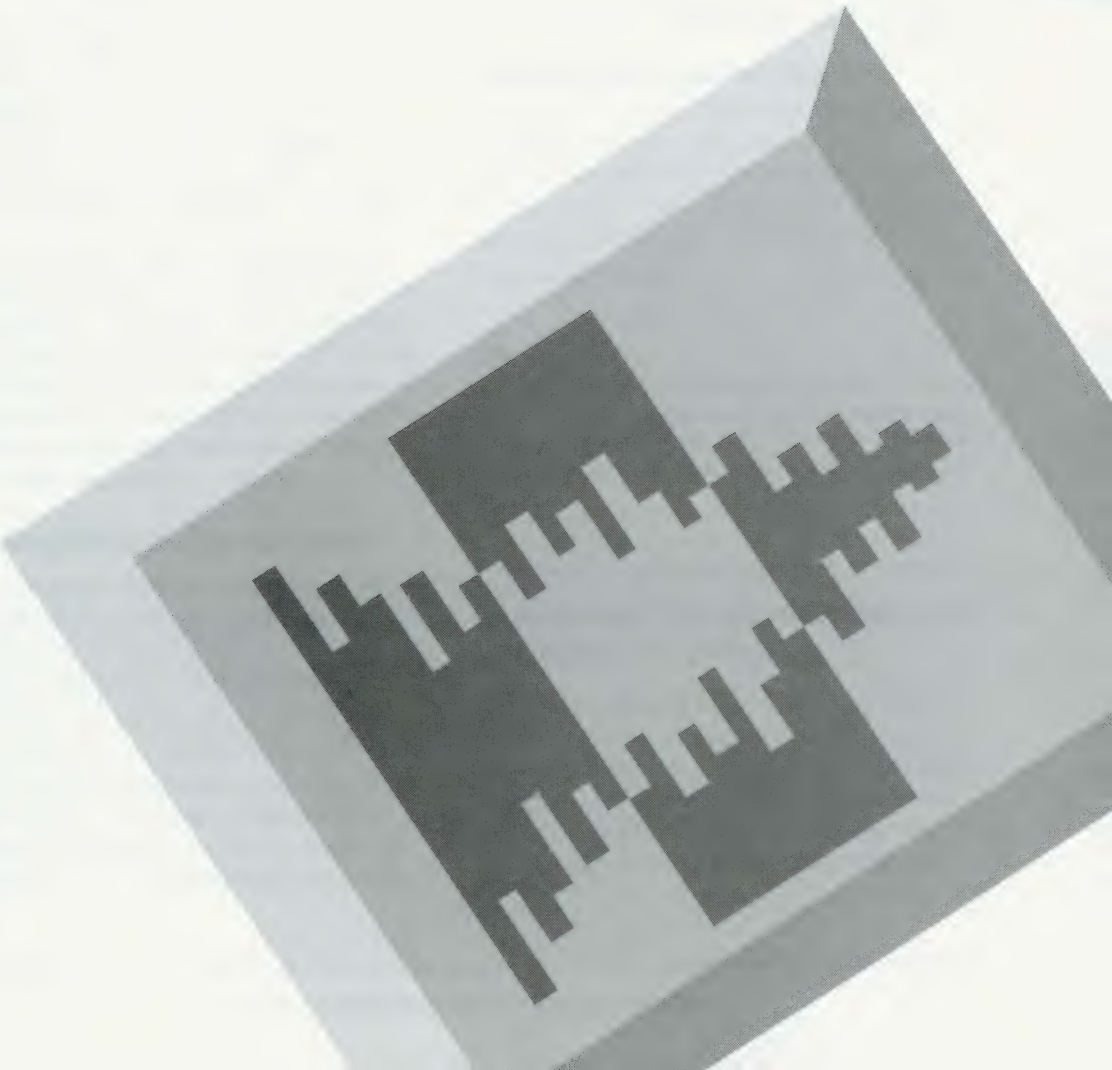
Installing the Audiomedia III card

6. Remove the Audiomedia III card from its antistatic bag and install it into the desired PCI slot inside your Macintosh. Push the card firmly but gently into the PCI slot until it is properly seated. The metal tab on the computer's chassis fits into the card's bracket, helping to keep it properly seated.
7. Swing the expansion card cover closed and secure it in place.
8. Replace the cover of your Macintosh.



Replacing the Macintosh's cover

Connecting Hard Drives to Your Pro Tools System



Chapter 4

Connecting Hard Drives to Your Pro Tools System

About Hard Drives

Because Pro Tools is a disk-based recording system, your hard drives function as the recording media in your studio. That is where you will record audio and keep your Pro Tools session and audio files.

How much recording time does a hard drive provide? It depends on the size of the hard drive. Current hard drives typically range from 1 to 23 gigabytes (a gigabyte is equivalent to a thousand megabytes). 24-bit Pro Tools audio tracks take about 7.5 megabytes of hard disk space per minute at a CD-fidelity sampling rate of 44.1 kHz. 16-bit Pro Tools audio tracks take about 5 megabytes of hard disk space per minute at 44.1 kHz.

If you are recording 24 tracks at the same time, that's 180 megabytes per minute for 24-bit audio or 120 megabytes per minute for 16-bit audio. Using this guideline, a 1 gigabyte hard disk will hold about 5 and a half minutes of 24 continuous tracks of 24-bit audio or 8 minutes of 24 continuous tracks of 16-bit audio. If you record additional tracks, you will use up additional disk space for each track that you record.

Formatting Drives for the Macintosh

Before you attach a SCSI drive to your Pro Tools system, the drive should be initialized for use with the Macintosh. Chances are, if you bought it from a dealer specifically for use with Pro Tools, it is already initialized for the Macintosh (but if you have any doubt, you should ask your dealer). If it isn't Mac-initialized, you'll need to initialize it using either the formatting software that was supplied with it, or FWB Software's Hard Disk ToolKit™, which is included with Pro Tools 24 systems. If you are not sure how to initialize a hard drive, consult the hard drive's documentation, the formatting software's User's Guide, or your dealer.

To initialize a drive on Pro Tools III systems, you must first connect the drive to your Macintosh's SCSI port (on the back of the Macintosh) with the appropriate SCSI cable. Then, initialize the drive with appropriate formatting software. After you have initialized the drive, turn off your Macintosh and reconnect the drive as explained in the section that follows.

Using Hard Drives Larger than 4 Gigabytes

Apple System version 7.6.1 and above can recognize hard drive partitions of up to 2 terabytes (1000 gigabytes). For Pro Tools 24 and Pro Tools III systems, this means that you are no longer limited to 4 gigabyte hard disk volumes and can take advantage of today's larger storage devices.

Pro Tools 4.2 does not support Apple's new System 8.1 volume format, "HFS Plus" (also known as Mac OS extended). If you are using System 8.1 and have HFS Plus-formatted hard disk volumes, Pro Tools will not allow you to use them for audio recording.

Connecting SCSI Hard Drives to a Pro Tools 24 System

After you have installed the Pro Tools 24 hardware in your computer, you must connect one or more SCSI hard drives to your Macintosh's internal and/or external SCSI bus, or a SCSI accelerator card installed inside your computer. Once the drives are connected they will function as the recording media in your studio. It is

there that you will record audio and keep your Pro Tools session files and audio files.

Pro Tools 24 and SCSI Hard Drive Performance

Pro Tools 24 and Its Host-based Disk Engine

Unlike Pro Tools III or Pro Tools Project cards, which contain their own dedicated SCSI hardware, the Pro Tools 24 card uses a "host-based" disk engine. This means that critical SCSI components of your system are no longer part of the Pro Tools cards themselves, but instead reside inside your Macintosh computer—either as part of its built-in SCSI hardware, or if you are using a Digidesign-approved SCSI disk accelerator card, as part of that card's hardware.

This host-based disk engine requires that SCSI hard drives be connected either to a Macintosh's SCSI bus or to a Digidesign-approved SCSI disk accelerator card installed inside your computer.

Internal and External SCSI busses

Recent Power Macintosh models (except the G3) have two SCSI busses: an internal "fast" SCSI bus and an external "standard" (narrow) SCSI bus. Each of these busses provide 7 SCSI IDs for SCSI drives and other devices. Of these two busses, the internal/fast SCSI bus provides better data throughput. By connecting drives which support "fast" (synchronous) SCSI transfers to the internal bus, you can improve Pro Tools recording/playback performance. Please consult your drive's documentation or contact its manufacturer to find out if it supports synchronous SCSI transfers.

While the internal bus on your Macintosh is faster, it may also limit your choices to certain fixed drives and removable media. This is one reason to consider use of an accelerator card on the external SCSI bus.

Some models of the Power Macintosh G3 have a single narrow SCSI bus for both external and internal devices. Therefore these models require a SCSI accelerator for expanded Pro Tools 24 systems. Consult your Digidesign dealer, local Digidesign office, or visit Digidesign's website for the latest compatibility information for G3 systems.

Pro Tools 24 System Performance Guidelines

Pro Tools 24 systems have more demanding requirements than do Pro Tools III or Pro Tools Project systems. The recording and playback performance of your Pro Tools 24 system depends on several factors.

Factors affecting system performance:

- Hard drive performance. The faster the drive's seek time, the better. The data transfer rate required for 32 track, 24-bit performance (at a sample rate of 44.1 kHz) is 4.04 MB per second of sustained throughput. This rate must be reflected in the performance of one or more of the drives and SCSI subsystems in your computer in order to achieve 32 track, 24-bit performance.
- Hard drive type. Optimal drives are fast (support synchronous transfers) and Ultra-Wide (have a 16-bit data bus running at a 20 MHz clock speed).
- CPU speed. The faster the CPU, the better. Overall system performance can affect track count.
- Use of a SCSI accelerator card. SCSI accelerators can significantly improve system performance.
- Size of your DAE Playback Buffer. See Chapter 6 of the Pro Tools System Installation Guide for an explanation of DAE Playback Buffer size and its effect on system performance.

In general, you can obtain the following performance goals with the following setups:

Up to 16 simultaneous tracks of 16-bit audio:

- One or more Digidesign-approved hard drives connected to the Macintosh's external SCSI bus. If your sessions have high-density edits (for example, 3 edits per second across all tracks, all with crossfades), you will need to distribute your audio files over more than one hard drive to allow for increased demand on drive seek capability.

Up to 32 simultaneous tracks of 16-bit or 24-bit audio:

- DAE version 3.21 or greater
- Two or more Digidesign-approved hard drives connected to the Macintosh's internal (fast) SCSI bus.
- Two or more Digidesign-approved hard drives connected to the Macintosh's internal (fast) SCSI bus and additional fast hard drives connected to the Macintosh's external (standard) SCSI bus.
- Two or more Digidesign-approved hard drives connected to a SCSI accelerator card installed inside your Macintosh. If you use a dual-channel SCSI accelerator card, equally allocate audio files to drives connected to each of the two busses on the card for optimal performance. The Pro Tools Disk Allocation dialog allows you to designate which drives you wish to use for recording. Distribution of the audio files between drives can be accomplished automatically by checking the Round Robin option in this dialog.

Additional Hard Drive Performance Tips:

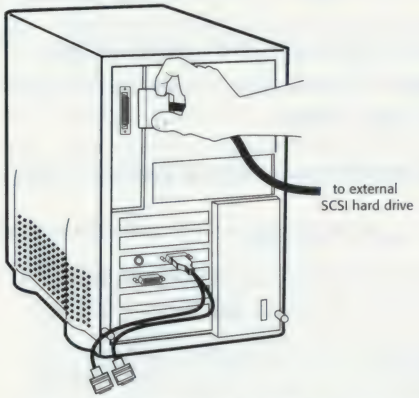
- Avoid partitioning drives (dividing them into smaller volumes) and distributing audio files from the same session onto the different partitions. This will reduce the drive's performance. Since Pro Tools now supports 4 gigabyte partitions, there is no real need to partition your audio drives.
- Use FWB Software's Hard Disk ToolKit™ PE software (included with Pro Tools 24) to optimize your hard drive. Consult the Hard Disk ToolKit manual for instructions on configuring and managing your hard drive(s) for optimum performance.
- Pro Tools sessions with high-density edits demand a SCSI accelerator card, fast drive(s), and/or large DAE Playback Buffer sizes. (Typically, a DAE Playback Buffer setting of "4" or "8.") See Chapter 6 of the Pro Tools System Installation Guide for an explanation of DAE Playback Buffer size.
- Though it is possible to daisy-chain up to 7 hard drives to the Macintosh's external SCSI bus (assuming a sufficient number of unused SCSI IDs is available), system performance can decrease if you utilize several drives on the external SCSI bus. In addition, overall system performance will be limited by the performance of the slowest hard drive on that bus. This means that if you have a very fast drive and a slow drive connected to the external SCSI bus, the faster drive will operate only as quickly as the slower drive. For best performance when using the external Macintosh SCSI bus, divide your files between a minimum number of drives, and try to use drives that have similar performance characteristics.
- If you are working with QuickTime movies, movie data must reside on a separate bus from the audio files. For example, if your session's audio files reside on disks connected to a SCSI accelerator card, video data should reside on drives connected to the Macintosh's internal or external SCSI bus.
- If you are using a 3-slot Macintosh, or a 6-slot Macintosh without a SCSI accelerator card, you can obtain optimum recording and playback performance by allocating audio files between two hard drives. (Pro Tools' Disk Allocation dialog allows you to designate which drives you wish to use for recording.) One drive should be installed on the internal Macintosh SCSI bus and the second connected to the external Macintosh SCSI bus.

- SCSI cable length. The maximum cable length that can be used on a "wide" SCSI bus is 3 meters if you are using fewer than four devices, or 1.5 meters if you are using four or more devices. (The terms "narrow" and "wide" refer to the width of the SCSI data bus. Narrow SCSI is an 8-bit bus. Wide SCSI is a 16-bit bus.)

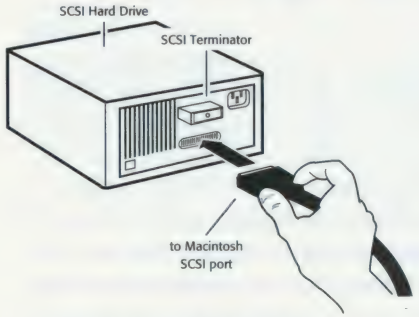
Digidesign can only guarantee optimum and reliable performance when Digidesign-qualified hard drives are used. Please contact Digidesign, your local Digidesign office, or Digidesign's website (www.digidesign.com) for a complete list of approved hard drives.

To connect an external SCSI drive to your computer:

1. Be sure that power to both the computer and hard drive is off.
2. Attach a SCSI cable from the SCSI port on the back of your Macintosh to one of the SCSI connectors on the back of your external SCSI hard drive. Always use the highest quality SCSI cables you can afford. Additionally, use the shortest SCSI cables possible to make the best possible connection — your total SCSI cable length should never exceed 3 meters. Please refer to your computer's owner's manual for the location of its external SCSI port. The illustration that follows depicts a Power Macintosh 9500-model computer.
3. Secure the SCSI cable to your computer with its thumbscrews. Secure the SCSI cable to your hard drive with the wire clips on the drive. Loose SCSI cables can cause problems with your system.
4. Connect any other drives by daisy-chaining from one drive to another. Cable lengths on the Macintosh SCSI chain should be kept to a minimum. Use the shortest length possible. The overall SCSI chain length should not exceed 3 meters.
5. Verify that the last SCSI device connected is properly terminated (see the section that follows regarding termination).
6. Attach a power cable to your hard drive(s). Your hard drives should now be properly connected and ready for use.



Connecting a SCSI cable to the Macintosh's SCSI port



Connecting an external SCSI hard drive

Proper Termination of a SCSI Chain

Your computer's SCSI chain must be properly terminated or your system will not function correctly. Only the last device on the chain should be terminated using the termination type recommended by your hard drive's manufacturer. The drive should use either an external terminator plug or have its internal terminators enabled. If you are using a terminator plug, Digidesign

recommends that you purchase and use an "active" terminator. These are available from most computer dealers.

Do not both enable internal termination and install an external terminator plug on the same drive! This will cause SCSI errors. Please refer to your hard drive's documentation for information regarding which type of termination it uses. Please note that termination and "term power" are two different things. Please consult your drive's documentation for more information.

Connecting a SCSI Hard Drive to Pro Tools III or Pro Tools Project Systems

After you have installed your Pro Tools Disk I/O or Project Audio Card in your computer, you must connect an external SCSI hard drive to it. Once this hard drive is connected it will function as the recording media in your studio. It is here that you will record audio and keep your Pro Tools Session files and audio files. This drive will appear on your Macintosh desktop just like any other external SCSI device.

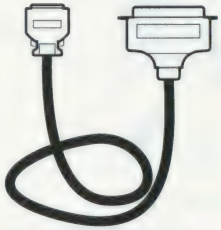
Using Multiple Hard Drives with Pro Tools III and Project Systems

If you wish to connect multiple hard drives to a Pro Tools III or Pro Tools Project system in order to increase storage, please be aware that a maximum of 5 hard drives can be connected (by daisy-chaining) to a single Pro Tools III Disk I/O card or Pro Tools Project Audio Card.

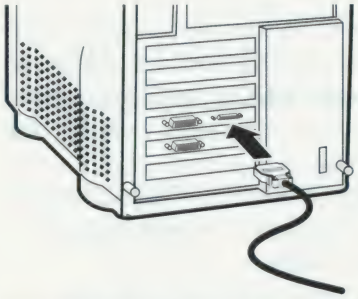
In order to ensure proper performance of your system, we highly recommend that you use a Digidesign-approved hard drive. Please contact your Digidesign dealer or your local Digidesign office for a complete list of approved drives.

To connect an external SCSI drive to Pro Tools:

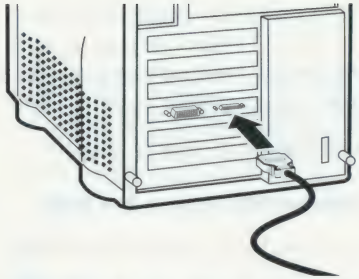
1. Be sure that power to both the computer and hard drive is off.
2. Connect the included SCSI cable to your Pro Tools Disk I/O card (or Pro Tools Project Audio Card if you have a Pro Tools Project system) as shown in the illustration. Push the connector into the SCSI port on the Pro Tools card and secure it firmly in place with its thumbscrews. A loose connection here will cause problems with your Pro Tools system.



The Pro Tools SCSI cable

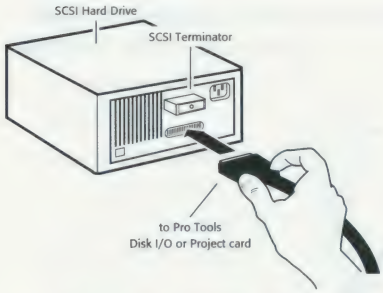


Connecting the SCSI cable to the Pro Tools Disk I/O card (Pro Tools III systems)



Connecting the SCSI cable to the Pro Tools Project Audio Card (Pro Tools Project systems)

3. Attach the other end of the SCSI cable to one of the SCSI connectors on the back of your external SCSI drive.



Connecting an external SCSI hard drive

4. When the cable is connected, snap the little wire clips on the drive into place to insure a solid connection. Loose SCSI cables can cause problems with your system.
5. Connect any other drives by daisy-chaining from one drive to another. Cable lengths on the Pro Tools SCSI chain should be kept to a minimum. Use the shortest length possible. (The overall SCSI chain length should not exceed 3 meters including the Pro Tools SCSI cable).
6. Verify that the last SCSI drive connected to the Pro Tools Project Audio Card is properly terminated (see the next section on termination).
7. Attach a power cable to your drive(s). Your hard drives should now be properly connected to Pro Tools and ready for recording.

Proper Termination of a SCSI Chain

The Pro Tools SCSI chain must be properly terminated or you system will not function correctly. Only the last device on the chain should be terminated using the termination type recommended by your hard drive's manufacturer. The drive should use either an external terminator plug or have its internal terminators enabled. If you are using a terminator plug, Digidesign recommends that you purchase and use an "active" terminator.

Do not both enable internal termination and install an external terminator plug on the same drive! This will cause SCSI errors. Please refer to your hard drive's documentation for information regarding which type of termination it uses. Please note that termination and "term power" are two different things. Please consult your drive's documentation for more information.

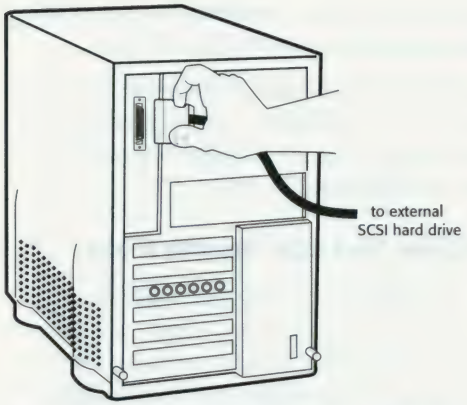
You can now skip ahead to the section entitled "Mounting Hard Drives and Enabling Fast SCSI Transfers with Mt. Digi."

Connecting a SCSI Hard Drive to Pro Tools Audiomedia III or PowerMix Systems

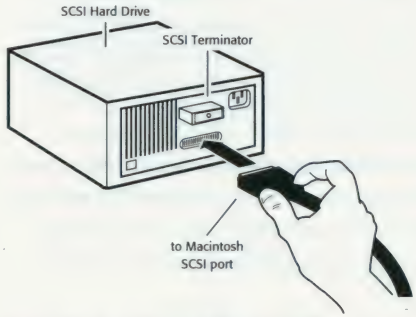
This section provides instructions for connecting external SCSI hard drives for use with Pro Tools Audiomedia III and Pro Tools PowerMix systems.

To connect an external SCSI drive to your Macintosh:

1. Be sure that power to both the computer and hard drive is off.
2. Attach a SCSI cable from the SCSI port on the back of your Macintosh to one of the SCSI connectors on the back of your external SCSI hard drive. Always use the highest quality SCSI cables you can afford. Additionally, use the shortest SCSI cables possible to make the best possible connection — your total SCSI cable length should never exceed 3 meters. Please refer to your computer's owner's manual for the location of the external SCSI port. The illustration that follows depicts a Power Macintosh 9500-model computer.
3. Secure the SCSI cable connection to your computer with its thumbscrews. Secure the SCSI cable connection to your hard drive by snapping the little wire clips into place. Loose SCSI cables can cause problems with your system.
4. Connect any other drives by daisy-chaining from one drive to another. Cable lengths on the Macintosh SCSI chain should be kept to a minimum. Use the shortest length possible. The overall SCSI chain length should not exceed 3 meters.
5. Verify that the last SCSI drive connected is properly terminated (see the preceding section, "Proper Termination of a Pro Tools SCSI Chain," for details).
6. Attach a power cable to your hard drives. Your hard drives should now be properly connected and ready for use.



Connecting a SCSI cable to the Macintosh's SCSI port



Connecting an external SCSI hard drive

Mounting Hard Drives and Enabling Fast SCSI Transfers with Mt. Digi

(Pro Tools III or Pro Tools Project Systems Only)

Your Pro Tools system comes with a utility called Mt. Digi which is installed as part of your Pro Tools software installation (covered in Chapter 6). This Control Panel device is useful for configuring certain hard drive-related aspects of your system. These include enabling "fast SCSI transfer" mode and adjusting the

time that your system takes to scan and locate hard drives connected to your Pro Tools SCSI bus.

After you have installed the Pro Tools software, we recommend that you refer back to the information given here to learn how to use Mt. Digi to improve hard drive-related system performance.

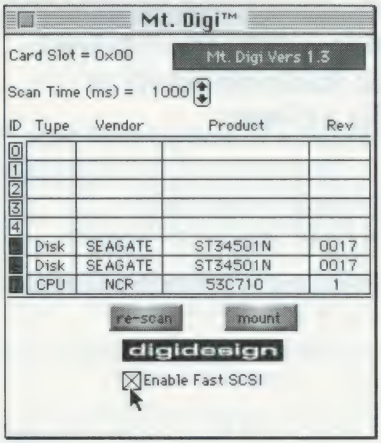
Enabling Fast SCSI Transfer Mode

Mt. Digi allows you to enable what is called fast SCSI mode. This mode, also known as synchronous transfer mode, is supported by SCSI 2 or newer hard drives. It allows faster transfer of data to and from your hard drive via the SCSI bus on Pro Tools III Disk I/O and Pro Tools Project cards. Since this can help improve your system's performance, Digidesign recommends that you enable this option. (If, however, you have an older SCSI I-type drive, or are having disk performance problems, you may wish to leave this option off.)

Digidesign recommends that you use an "active" terminator if you plan to use Fast SCSI mode. This type of terminator provides more stable termination resistance. Active terminators are available from most computer dealers.

To activate Fast SCSI transfers:

1. Make sure that Mt. Digi has been installed into your Control Panels folder within your System Folder. (You must have first run the Pro Tools Software Installer.)
2. From the Apple menu, choose Control Panels and select Mt. Digi from the submenu.
3. When Mt. Digi appears, select the Enable Fast SCSI option.
4. Restart your computer in order for the change to take effect.
5. If a drive appears not to function properly when fast SCSI transfers are enabled, simply deselect the Enable Fast SCSI option in Mt. Digi and restart your computer.



Mt. Digi Control Panel

Adjusting Scan Times on the Pro Tools SCSI Bus

(Pro Tools III and Pro Tools Project Systems only)

The Mt. Digi Control Panel also allows you to provide additional time for your system to recognize drives that may be slow to mount, or alternatively, increase the load speed of the DigiSystem INIT by decreasing drive scan time. You can do this by adjusting the Scan Time setting, which controls the time your system spends scanning for hard drives. The Pro Tools default scan time is 1000 ms.

To adjust drive mount scan time with Mt. Digi:

1. From the Apple menu, choose Control Panels and select Mt. Digi from the submenu.
2. Using the up/down arrows next to the Scan Time field, experiment to find the optimum scan time for your drives.
3. Each time you change the values, click the Mount button. Mt. Digi will scan the Disk I/O or Project SCSI bus and attempt to mount your drives. If you have set a time that is too short, your drives may

not respond quickly enough and fail to appear on the Desktop.

4. If your drives fail to mount, increase the scan time until they do appear. You have now optimized the scan time for your drives.

Mounting Drives with Mt. Digi

A third use for the Mt. Digi Control panel is to scan for and mount hard drives that you may have turned on after starting your computer without having to restart your system.

To use Mt. Digi to mount hard drives:

1. Choose Mt. Digi from the Apple menu's Control Panels submenu. Mt. Digi appears.
2. Click the re-scan button to scan the SCSI devices currently connected to your system. You can toggle between multiple Pro Tools Disk I/O or Pro Tools Project SCSI cards by clicking the "Card Slot =" text in the upper left corner of Mt. Digi.
3. Click the Mount button to mount the drives that appear on the chosen SCSI bus.

Though the "mount" button will allow you to mount drives without restarting your system, they will not be in Fast SCSI mode even if the "Enable Fast SCSI" option has been enabled. In this case, you must restart your computer to enable Fast SCSI mode.

Using Iomega Jaz Drives

Pro Tools 4.2 supports use of Iomega Jaz drives. Each Jaz drive will reliably provide up to 8-track recording and playback of 16-bit audio files. The following section describes how to configure and use a Jaz drive with your Pro Tools 4.2 software.

1. Prepare the Jaz Cartridge.

   Before using the Jaz drive with Pro Tools, the cartridges must be initialized for use with the Macintosh. Initialization must be performed using Iomega's Jaz Tools while the Jaz drive is connected to the Macintosh SCSI bus. Before initializing a cartridge, enable the Verify Disk Writes checkbox in the Iomega Drive Options dialog. This option provides additional data protection by ensuring that all data written to disk is done so correctly as the data is written. Digidesign recommends that you do this in order to provide the highest data integrity. (The Iomega Jaz Tools are included with the Jaz Drive or they can be downloaded from Iomega's web site: www.iomega.com.)

   With the Verify Disk Writes option enabled, Jaz drives can be used with Pro Tools systems to record and play back up to 8 tracks, depending on the capabilities of your Pro Tools system. Digidesign does not recommend disabling the Verify Disk Writes option since data integrity may be compromised.

2. Connect the Jaz Drive to your Pro Tools system.

   Once the Jaz cartridge has been initialized, connect the Jaz drive to your system. For Pro Tools 24 systems, connect it to your Macintosh SCSI bus or SCSI accelerator card. For Pro Tools III or Project systems, connect it to your Disk I/O or Project card. For Audiomedia III or PowerMix-based systems, connect it to your Macintosh SCSI bus.

3. Mount the Jaz Cartridge.

   With the Jaz drive attached to the your system's SCSI bus, cartridges may be inserted and spun up prior to starting your Macintosh, or they may be inserted afterwards.

   On Pro Tools III and Pro Project systems, if a Jaz cartridge is not inserted and spun up prior to starting your Macintosh, and there are no other active SCSI devices on the Pro Tools SCSI bus, the DigiSystem

INIT will indicate a "No Drive" error. Simply wait for the computer to finish starting up, then insert a cartridge. Once the cartridge has spun up, it will appear on the desktop and be ready for use.

Additional Recommendations

Digidesign also recommends using the Jaz drive with the Fast SCSI transfers option enabled in the Mt. Digi utility. This Digidesign drive utility was installed with your Pro Tools 4.2 software.

To enable Fast SCSI transfer:

1. From the Apple Menu, select Control Panels and select Mt. Digi from the submenu.
2. When Mt. Digi appears, select the Enable Fast SCSI option.
3. Restart your computer with a Jaz cartridge installed and spun up for these changes to take effect. Once fast transfers are enabled on the Jaz drive, it will remain in fast mode (even if you exchange cartridges) until you shut down, or restart without a cartridge inserted.

Sleep Mode

Jaz drives utilize a sleep timer to spin down cartridges after a period of inactivity in order to minimize wear. The default inactivity period is 30 minutes. Pro Tools maintains this time period and allows Jaz to spin down cartridges without affecting activity on the Pro Tools SCSI bus.

Jaz users wishing to play back from or record to a Jaz drive which is asleep will experience up to a 15 second delay as the cartridge spins up. Once the cartridge is ready, normal playback or record operations will begin.

Cartridge Ejection

In order to minimize restart times, Pro Tools will not automatically eject cartridges at restart or shutdown. To eject a Jaz cartridge after use, simply drag the cartridge icon to the Trash.

Never eject cartridges while Pro Tools is running or serious data loss could occur. Always quit the Pro Tools application before ejecting cartridges.

Cartridge Care

To ensure the longevity of your Jaz cartridges, follow the manufacturer's procedures for care and handling. Do not store cartridges on or near audio monitors or data loss may result. We recommend that you periodically reformat and reinitialize Jaz cartridges in order to maintain the highest possible performance and data integrity.

Keeping Your Hard Drive Tuned Up

Because Pro Tools is a disk-based audio production system, keeping your hard drives in good operating condition is essential. Like most recording devices, hard drives require regular maintenance in order to operate at their optimum level. In this section, you'll learn about initializing, optimizing and formatting hard drives and when you should perform each of these functions to keep your system running smoothly.

Avoiding Fragmentation

For maximum efficiency, data should be written to your hard drive in a contiguous fashion—that is, in an unbroken stream on the disk, as on a record, where sound is recorded in one continuous groove from beginning to end. This helps keep the drive from having to go searching very far to find the data it needs for playback. Unfortunately, your computer can't always store the sound files in this way because other files may take up space on the disk. Thus, when your computer writes a new file, it must write it where it can find space.

However, in a multitrack recording, the audio tracks are written in discreet files, spaced evenly across the

volume. Fragmentation of individual files may be zero, but the audio tracks may be located over a wide enough distance that playback of the tracks will be very seek intensive. Also, this will cause the remaining free space to be discontiguous, which will result in quicker file fragmentation as subsequent record passes take place.

Editing of audio files is a major cause of fragmentation. If all you do is play back audio, without altering it in any way, your disk should not become fragmented.

When there are very few files on your hard disk, there is plenty of open space where files can be written contiguously. But as the disk fills up, the areas of open space become fewer and smaller. The end result is that the drive has to break file data into smaller and smaller sections and scatter them around the disk, writing them wherever there is space. This slows down the drive because when it comes time to read the data, it has to do a lot of searching to find the different pieces that make up the file. This phenomenon is referred to as fragmentation.

To keep your drive's performance at a maximum, it's best to keep file fragmentation to a minimum. As fragmentation increases, it's harder for the drive to retrieve and send file information to the computer quickly. What happens if the computer doesn't get the information fast enough? Disk errors, which can interfere with playback of audio. Even minor fragmentation can result in stuttering playback of audio files.

Optimizing Your Drive

To prevent this from happening you can optimize your drive. This means rearranging your files into a contiguous form. There are many software programs that do this for you. When you optimize a drive, each file is regrouped and arranged on the drive in a linear format, making it much easier for the drive to access the data when it's needed. Most optimizing software lets you run a check on a drive to find out the percentage of fragmentation. The amount of fragmentation found will determine if your drive needs to be optimized. In most cases, if your drive shows moderate to heavy fragmentation, you should consider optimizing it.

How Often Should You Optimize?

If you use your system for intensive editing, or if you frequently delete audio or fade files from your hard drive, you may need to optimize your drives on a semi-weekly basis, or even every few days, since it doesn't take long for even a large hard disk to become fragmented. This recommendation applies to less frequent usage as well. The more often you check your drives, the fewer problems you'll have. However, optimizing a hard disk can take time.

Since your files will be rewritten by the optimization process, always remember to make a backup copy of the data on your hard drive before you optimize it! (This goes for initializing and formatting too, which we'll cover next.) We recommend that you use a hard disk utility to find and repair any problems before optimizing data. If there is any damage to your hard drive's directories prior to optimizing, serious data loss may result.

Before optimizing or defragmenting a hard disk, remove it from the Disk I/O SCSI bus and connect it to the Macintosh SCSI bus. Be sure to always follow the manufacturer's instructions and back up important data before defragmenting the disk.

Formatting a Drive

Now you've learned how and why to keep your hard drive in good shape by optimizing it. But there's more to hard drive maintenance that just optimization. In order for a hard drive to locate and rearrange its files, its directories must also be intact and in good condition. The drive's directories are like a map that the drive and the operating system use to locate files when the computer asks for them.

To prevent directory problems from occurring on your system, it's important that you regularly perform a high-level format on your drive referred to as initialization. Initializing a hard drive erases the old directory structure (destroying links to old data), and creates a new default directory structure. That's why it is important that you back up (make a safety copy of) all the sound files and other information on your drive before you initialize it.

Initialize Often

Because recording, processing, and playing digital audio are very demanding on a hard drive, it is wise to tune up your drive frequently. If you find yourself using your system on a very frequent basis, many hours a day, you should consider reinitializing on a monthly or even bi-weekly basis.

What is Formatting?

When we refer to formatting a drive, we are really speaking of two different types of formatting: high-level formatting and low-level formatting. Here is how they differ:

Low-Level ("Physical") Formatting

Low-level formatting means completely erasing the hard drive and rewriting each sector address on the drive. In low-level formatting, the sector and track addresses, error-correction codes, and other details, are written on the platters of the hard drive in the form of a magnetic pattern. Usually, spare sectors are included at the end of each track, and spare tracks are included for each cylinder. A low-level format permanently erases all data on the drive.

When is Low-Level Formatting Necessary?

Virtually all hard drives come pre-formatted from the manufacturer. This is done under optimal environmental conditions. Because of this, low-level formatting is generally unnecessary except in rare circumstances. They are:

- If you wish to changing the Block Size of the drive. This is not recommended by Digidesign. Digidesign systems only recognize 512-byte blocks.
- If you wish to perform permanent deletion of data.
- If you wish to "clean" a drive that is being migrated from one operating system to another (for instance, from UNIX to Macintosh).

Since the original low-level formatting done by the manufacturer is performed under optimal conditions, and since the format operation can take up to three hours (depending on the size of the drive), most manufacturers agree that low-level formatting of drives is unnecessary, unless one or more of the previous conditions apply.

Care should also be taken to assure that there are no power interruptions (spikes, power loss), or computer bus resets during the format operation.

High-Level Formatting ("Logical Formatting" or "Initialization")

High-level formatting or initializing a drive is similar to low-level formatting in that the drive's directory, volume partition map and drivers are replaced (meaning that the data on the drive is irretrievably gone). But in this case, the drive itself is not erased, nor is verification performed. During this initialization, information about the drive is created and drivers that communicate this information to the host CPU are installed. The information includes:

Master Directory Block (Volume Information Block): This contains information about the volume (the drive), including the volume's name, type, allocation block size, number of files and folders and their locations.

Volume Bit Map This keeps track of which blocks are free and which are in use.

Catalog Tree This contains file records for all files and folders. Information includes: file name, number, type,

creator, fork size, Finder flags, creation and modification dates, and locations of files on disk.

Extents Tree This keeps track of the location and "ownership" of file fragments.

When is High-Level Formatting (Initialization) Necessary?

It is generally necessary to initialize a hard drive in one of the following cases:

- If you suspect that the directories containing the drive's information have become corrupted.
- If a new drive is being prepared for use on a computer for the first time in order to communicate with the host CPU operating system and was not initialized for the MacOS by the Hard Drive vendor.
- If a drive is being changed from one platform to another. For example if you are switching from a Macintosh to a Windows-based system, or vice-versa, the drive must be reinitialized for the new operating system.

About Partitioning

Partitioning divides a physical drive into multiple, unique volumes, almost as if you were creating "virtual hard drives." Partitioning is usually performed when the drive is initialized.

The Macintosh operating system limits single files to a maximum size of 2048MB. Because Pro Tools allocates all available contiguous hard disk space for recording, it may be necessary to partition audio drives that are larger than 2048MB in order to limit single track recordings to 2048MB. (Alternatively, you could record a second "dummy" track at the same time as the desired track, and drag the dummy file to the trash after recording is completed.)

With System 7.6.1 and above, drives larger than 4096MB can be seen as whole volumes. However, the drive must be initialized with a utility that recognizes the 2 terabyte limit. Please be aware that the 2048MB maximum size for single files still applies.

Seek Times on Partitioned Drives

Seek times are actually faster on partitioned drives (assuming that reads and writes are performed on a single partition), since the heads only have to seek within the partition boundaries, rather than the whole capacity of the drive.

In addition, smaller partitions perform faster than larger partitions. However, this comes at the expense of contiguous storage space. When you partition a drive, you will need to find the compromise that best suits your performance and storage requirements.

Most drives are formatted so that there are more sectors on the outer cylinders than on the inner cylinders. This means that reads and writes of contiguous audio files can be accomplished faster on the outer cylinders than inner cylinders because the read/write heads can stay in one position for a longer duration while performing read/write operations without having to perform a track switch.

Thus, one performance tip is to partition your drive and use the outer partition for tracking and editing (since these tasks are more speed-dependent) and use the inner partition for storage.

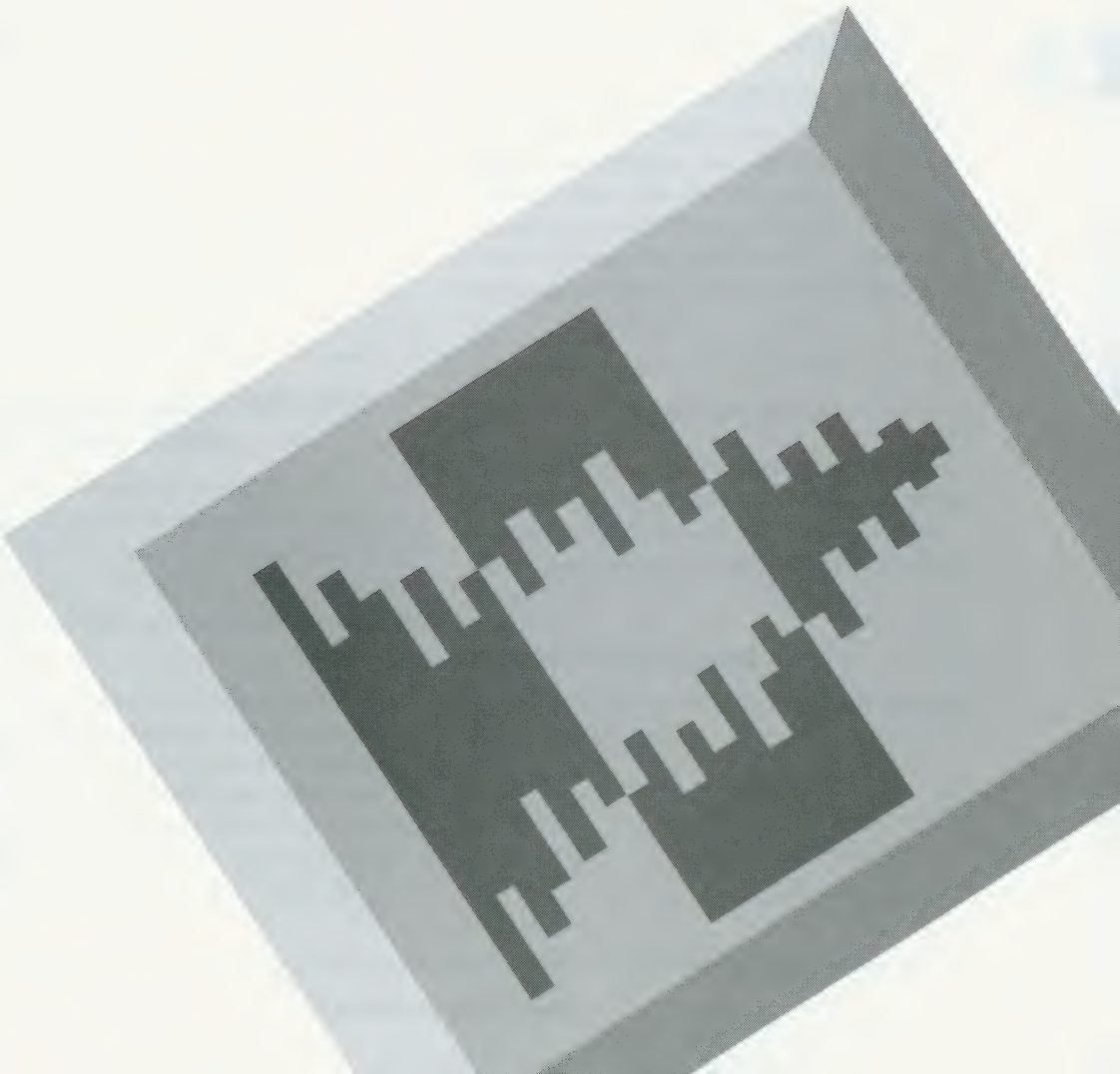
On Pro Tools 24 systems, avoid distributing audio files within a session over different partitions on the same drive. If you do, you will experience degraded system performance.

Software Products that Can Help You Tune Up Your Hard Drive

While there are a number of software products available for hard drive maintenance, Digidesign recommends that you use FWB Software's Hard Disk ToolKit drive management and formatting software. This utility is included with all Pro Tools 24 systems.

In the end, the time you spend keeping your drive in good shape will be well worth the effort. Take good care of your drive and your drive will take good care of your Pro Tools projects.

Connecting Your Studio



Chapter 5

Connecting Your Studio

Introduction

In this chapter you will learn how to connect your Pro Tools system to the rest of your studio equipment, including your mixer and amplification system, digital recording devices (such as DAT), and SMPTE synchronization devices. Your studio setup will differ depending on your Pro Tools configuration.

The explanations that follow are organized according to the type of interface or Pro Tools configuration you have. Instructions are provided for each:

- 888/24 I/O: pages 51 - 57
- 882/20 I/O: pages 58 - 62
- Audiomedia III-based systems: pages 62 - 63
- PowerMix-based systems: pages 63 - 64

Stereo Mix Outputs Mode and Direct Outputs Mode

Before you begin connecting Pro Tools to the rest of your studio, you should think about how you plan to use Pro Tools. This will determine exactly how you connect your system to the other elements in your studio such as your mixing console, outboard effects devices, and so on.

Pro Tools software provides you with two different output modes, Direct Outputs and Stereo Mix Outputs, which allow you to configure Pro Tools to match your particular needs. Either of these modes can be selected with the Preferences command in the Setups menu. In Stereo Mix mode, each audio track or channel can be panned between any pair of outputs on your Audio Interface (1-2, 3-4, 5-6, or 7-8). In Direct Outputs mode, each track/channel is routed to a discrete output on your Audio Interface. In this mode no panning controls are available.

Stereo Mix mode is useful for stereo final mixes of all the elements of your Pro Tools Sessions. Using Stereo Mix mode with more than one pair of stereo outputs can be very useful in post production for creating "stem" and "M&E" (music and effects) mixes, where it's convenient to have audio elements in stereo pairs.

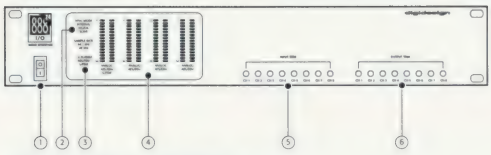
Direct Outputs mode is useful for laying back elements to multitrack tape or feeding audio to individual channels of a mixing console. You can switch the Pro Tools software back and forth between modes with the click of your mouse, but if you do, you will lose any panning settings in the session. We suggest that you think about your application before you start making connections.

The 888/24 I/O Interface

This section of your User's Guide explains each of the connectors and indicators on the front and back panels of the 888/24 I/O Interface, how they are used, and offers suggestions for connecting the 888/24 I/O to your studio.

888/24 I/O Front Panel

The 888/24 I/O has the following front panel indicators, moving from left to right:



The front panel of the 888/24 I/O

1. Power

This switch applies power to the 888/24 I/O. The "I" position is on. The "O" position is off.

2. Sync Mode

The Sync Mode LEDs indicate which sample rate clock reference is currently used by the analog-to-digital converters (ADC) and the digital-to-analog converters (DAC).

Internal This is the 888/24 I/O's standard setting. In this mode, the 888/24 I/O's sample rate is generated by its internal crystal oscillator (the internal clock frequency used is determined by the Sample Rate setting in the Hardware dialog in Pro Tools' Setups menu). Internal mode should be active whenever the 888/24 I/O is NOT synchronized to an external clock source.

Digital This setting indicates that an AES/EBU or S/PDIF word clock signal is currently the source for the 888/24 I/O's sample rate. This is the setting you would use for inputting material from DAT machines or other digital devices. If you wish to use the 888/24 I/O's digital inputs and outputs as effects sends and returns to digital effects devices, you should set the 888/24 I/O to Internal Sync Mode (unless it is already synchronized to an external clock source such as a DAT deck). You should then set the digital effects device to accept an external digital clock (the 888/24 I/O) so it synchronizes itself to Pro Tools.

The 888/24 I/O can only synchronize to and receive word clock lock on channels 1-2 of its digital inputs. If you wish to synchronize your system to an external digital clock source, it must be connected to digital inputs 1-2 of the 888/24 I/O. In an expanded Pro Tools 24 or Pro Tools III system, the system clock is carried by the Audio Interface connected to the first Pro Tools card in your system. This Audio Interface will act as the "master" interface in your system. All other Audio Interfaces will be slaved to it.

Because some digital audio devices do not output proper clock when they are not playing back, leaving the 888/24 I/O in Digital Sync Mode may cause Pro Tools' audio playback quality to suffer, or play back at the wrong pitch. If you are using digital I/O with the Pro Tools hardware, always remember to reset the Sync Mode from Digital to Internal after inputting material. This can be done with the Session Setup window or with the Hardware dialog in Pro Tools' Setups menu.

Slave This LED is lit when the 888/24 I/O's sample rate is synchronized to another Digidesign Audio Interface or synchronization peripheral. In this mode, the "slave" interface's sample rate is derived from the frequency of the incoming master clock signal present at the Slave Clock (256x) port. The 888/24 I/O automatically switches to this mode when a Slave Clock Out signal from another Digidesign Interface, Universal Slave Driver, Video Slave Driver, or SMPTE Slave Driver is connected to the 888/24 I/O's Slave Clock In port.

This applies in expanded Pro Tools configurations. In such cases, the master Audio Interface's Super Clock output locks all other interfaces together with sample accuracy, keeping all signals phase synchronous.

3. Sample Rate and 1-2 Format Indicators

These LEDs indicate the sample rate of the 888/24 I/O's internal crystal oscillator and the digital format (AES/EBU or S/PDIF) of the audio input signal to channels 1 and 2. The choice of digital format for these two channels is made in the Session Setup window or Hardware dialog in Pro Tools' Setups menu. Digital input pairs 3-4, 5-6, and 7-8 of the 888/24 I/O are always

AES/EBU. Sample Rate is set in the Session Setup window or Hardware dialog in Pro Tools' Setups menu.

The 888/24 I/O provides the following sample rates:

48 kHz This is a standard sampling rate of many professional audio devices. It is recommended for use with devices that cannot receive digital transfers at 44.1 kHz.

44.1 kHz This is the compact disc standard sampling rate and the Pro Tools default sample rate. In order to avoid the necessity of sample rate conversion (which can degrade sound quality) you should use this rate whenever you are recording material that will ultimately be published on a compact disc.

When you are using an external digital source such as a DAT machine, keep in mind that the sample rate indicated on the 888/24 I/O's front panel reflects ONLY the 888/24 I/O's internal oscillator sample rate, NOT that of the external DAT machine. If the sample rate setting in Pro Tools' Session Setup window does not match that of the digital device being recorded, the material will play back at the wrong pitch when the 888/24 I/O reverts to Internal Sync mode.

4. Level Meters

The 888/24 I/O's audio level meters are high-resolution, 15-segment LED meters calibrated such that a reading of -20 dB corresponds to the 888/24 I/O's nominal operating level of +4 dBu. Please note that these meters monitor the channel output levels of Pro Tools. Input levels are monitored within the Pro Tools software.

The red LED indicators on the Audio Interface indicate both "full-code" (highest level before clipping) and clipping of Pro Tools' output signals. The on-screen meters in Pro Tools software indicate clipping when at least three consecutive full-code samples follow each other.

5. Input Level Trims

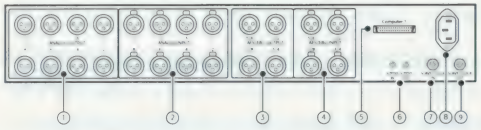
The 888/24 I/O is factory calibrated with input operating levels set to +4 dBu nominal, +20 dB headroom nominal. These trim pots allow adjustment of the 888/24 I/O's input levels to match the operating level of your external equipment. Adjustments can be made with a Phillips screwdriver. In addition, the Calibration Tool software utility included with Pro Tools allows you to calibrate the input and output levels of the 888/24 I/O to match your mixing console or other devices in your studio. Instructions for using Calibration Tool appear later in this chapter.

6. Output Level Trims

The 888/24 I/O is factory calibrated with output operating levels set to +4 dBu nominal, +20 dB headroom nominal. These trim pots allow adjustment of the 888/24 I/O's output levels to match the operating level of your external equipment. Adjustments can be made with a Phillips screwdriver. In addition, the Calibration Tool software utility included with Pro Tools allows you to calibrate the input and output levels of the 888/24 I/O to match your mixing console or other devices in your studio. Instructions for using Calibration Tool appear later in this chapter.

888/24 I/O Back Panel

The 888/24 I/O has the following back panel connectors, moving from left to right:



The back panel of the 888/24 I/O

1. Analog Audio Outputs

These are balanced male XLR connectors for analog audio output connections. All eight output channels are continuously active. The 888/24 I/O's analog outputs feature 20-bit digital-to-analog converters.

2. Analog Audio Inputs

These are balanced female XLR connectors for analog audio input connections. The 888/24 I/O's analog inputs feature 24-bit analog-to-digital converters. Because input channels 1-8 of the 888/24 I/O are software selectable in pairs between analog or digital format, analog input to a channel pair is disabled when digital input format is chosen for that channel in the Hardware dialog in Pro Tools' Setups menu. The 888/24 I/O's analog audio connectors are balanced XLRs with pin 2 wired "hot", (or "+"); pin 3 cold, (or "-"); and pin 1 ground. (For a wiring diagram, refer to the section entitled "Making Signal Connections to the 888/24 I/O" later in this chapter.)

3. AES/EBU Digital Outputs 1-8

The 888/24 I/O's AES/EBU output jacks are balanced, three conductor, XLR connectors which output a 24-bit digital data stream. Output is continuously active on both the AES/EBU and S/PDIF jacks even when the 888/24 I/O's input selector is set to Analog.

4. AES/EBU Digital Inputs 1-8

The AES/EBU digital format is used in many professional digital audio devices, including some DAT recorders. The Interface's AES/EBU input jacks are balanced, three conductor, XLR connectors which accept a full 24-bit digital data stream.

For AES/EBU connections, 110-ohm cables are highly recommended for use in professional installations. For best results, cable lengths should not exceed 30 meters. Consult your local pro audio dealer for more information on 110-ohm cables.

Input channels 1-8 of the 888/24 I/O are software-selectable in pairs between analog or digital format. Digital input to a channel pair is disabled when analog input format is chosen for that channel in the Hardware dialog in Pro Tools' Setups menu. In addition, input to AES/EBU input channels 1-2 is disabled when S/PDIF digital format is chosen for these inputs in Pro Tools' Hardware dialog.

5. 50-pin Interface Connector

The 50-pin "Computer" connector is used to connect the 888/24 I/O to a d24 card, Disk I/O card, or a DSP Farm card. The necessary cable is supplied with the 888/24 I/O. If you plan to connect two 888/24 I/O's to a d24 card, an additional 16-channel peripheral cable adapter is necessary. (This cable is available from your authorized Digidesign reseller.)

6. S/PDIF Digital Input/Output

S/PDIF stands for Sony/Phillips Digital Interface Format. This digital format is used in many consumer CD players and DAT recorders. The 888/24 I/O's S/PDIF in/out jacks are unbalanced 2-conductor phono (RCA) jacks which utilize a full 24-bit digital data stream. To avoid RF interference, use 75-ohm coaxial cable for S/PDIF transfers and keep the cable length to a maximum of 10 meters. Consult your local pro audio dealer for more information on 75-ohm cables.

Because input channels 1-2 of the 888/24 I/O are software selectable between analog or digital format, input to these two digital channels is disabled when analog input is chosen or when AES/EBU digital format is chosen in the Hardware command in Pro Tools' Setups menu. Output is continuously active on both the AES/EBU and S/PDIF output jacks, regardless of which digital input format is selected for channels 1-2.

7/9. Slave Clock In/Out

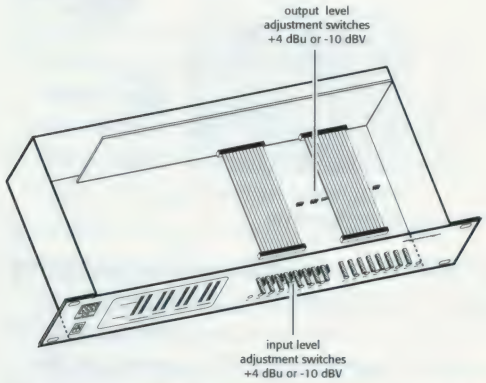
The Slave Clock Out jack is a standard BNC type connector that outputs a 256 times sample rate "Super Clock" signal for slaving and synchronizing multiple Digidesign Interfaces and synchronization peripherals together. Because crucial timing data is passed via these ports, you should use high-quality, 75-ohm RG-59 cables for making connections, and keep total cable length to less than 3 meters between interfaces.

8. Power Input

This connector accepts a standard AC power cable. The 888/24 I/O is auto power-selecting (100V to 240V) and will automatically work with a standard modular cable to connect to AC power receptacles in any country.

Changing the Operating Levels of Individual 888/24 I/O Channels

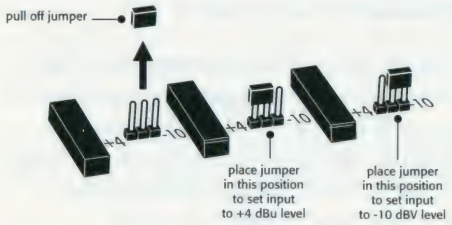
The 888/24 I/O is factory set to +4 dBu operating levels for input and output. However, the 888/24 I/O allows you to individually switch any of its analog inputs or outputs to either a +4 dBu or -10 dBV operating level by moving internal jumpers on its circuit board. The following section describes how to do this.



The location of input and output level switches inside the 888/24 I/O

To change the operating level of an input channel:

1. Make sure that your computer and 888/24 I/O are turned off.
2. With a Phillips screwdriver, remove the screws from the top of the 888/24 I/O.
3. Using the 1/16 inch hex wrench included with the 888/24 I/O, carefully remove the front four panel screws as noted on the bag containing the hex wrench.
4. Lift the top off of the 888/24 I/O.
5. Inside the 888/24 I/O's chassis, next to each of the channel input trims, there is a jumper switch with a removable cap. Locate the jumper switch for the channel you wish to modify. Gently lift the cap off the 3-pronged connector. Place it in the position corresponding to the operating level that you desire. For +4 dBu levels, it should be placed over the rear two prongs. For -10 dBV levels, it should be placed over the front two prongs. Refer to the illustration for details.
6. After you have made the desired changes, replace the top of the 888/24 I/O.
7. Replace the four front panel screws using the hex wrench.
8. Replace the top screws with a Phillips screwdriver.

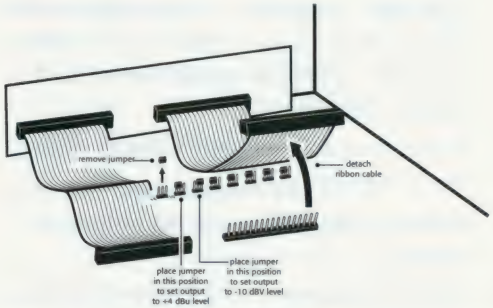


Setting the input level jumper switches

To change the operating level of an output channel:

1. Make sure that your computer and the 888/24 I/O are turned off.
2. Using the 1/16 inch hex wrench included with the 888/24 I/O, carefully remove the front four panel screws as noted on the bag containing the hex wrench.
3. With a Phillips screwdriver, remove the screws from the top of the 888/24 I/O and lift the top off of the 888/24 I/O.

4. To find the channel output switches, detach the front part of the ribbon cable at the right side of the chassis. To do this, grip both sides of the black connector and gently pull up. Refer to the illustration for details.
5. With the ribbon cable out of the way you'll see eight 3-pronged jumper switches, each with a removable cap. Locate the switch for the channel you wish to modify.

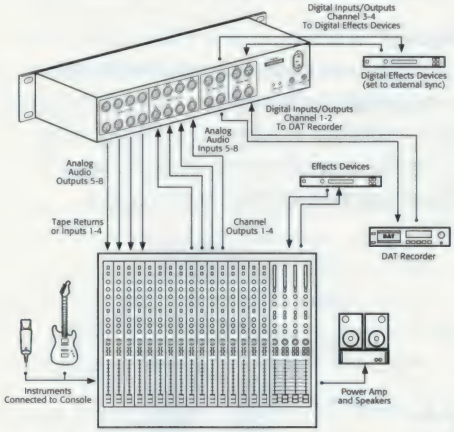

remove jumper
detach ribbon cable
place jumper in this position to set output to +4 dBu level
place jumper in this position to set output to -10 dBV level

Setting the output level jumper switches

6. Gently lift the cap off of the jumper switch. Place it in the position corresponding to the operating level that you desire. For +4 dBu levels, it should be placed over the left two prongs. For -10 dBV levels, it should be placed over the right two prongs. Again, refer to the illustration for details.
7. After you have made the desired changes, reconnect the ribbon cable and put the top back on the 888/24 I/O.
8. Replace the four front panel screws using the hex wrench.
9. Replace the top screws with a Phillips screwdriver.

Making Signal Connections to the 888/24 I/O

Depending on how you plan to use the 888/24 I/O, the way you connect it to your studio will differ. The following section provides some general suggestions for signal connection to your system. This diagram illustrates a typical studio setup, with the 888/24 I/O connected to a mixing console, and effects and other equipment connected to the 888/24 I/O and the console as well.


Digital Inputs/Outputs Channel 3-4 To Digital Effects Devices
Digital Effects Devices (set to external sync)
Digital Inputs/Outputs Channel 1-2 To DAT Recorder
Analog Audio Inputs 5-8
Analog Audio Outputs 5-8
Effects Devices
Tape Returns or Inputs 1-4
Channel Outputs 1-4
DAT Recorder
Instruments Connected to Console
Power Amp and Speakers

A typical studio configuration

The 888/24 I/O's analog audio connectors are balanced XLR's with pin 2 wired "hot" (or "+"), pin 3 cold (or "–"), and pin 1 ground. If you are connecting a balanced system, pin 1 and shield should be connected at the input only (not at the output). This will prevent ground loops between the shield and pin 1 conductor. If you are connecting an unbalanced signal to the 888/24 I/O's inputs or outputs, connect only pin 2 to the "+" signal, and pins 1 and 3 to ground at all inputs only.

Using the 888/24 I/O Interface as a Stand-Alone Audio Converter

The 888/24 I/O can be used apart from Pro Tools as a stand-alone, 8-channel, 24-bit, analog-to-digital or digital-to-analog converter. This makes it extremely flexible in your studio.

Before you use the 888/24 I/O in stand-alone mode:

1. Make sure that your computer is turned off.
2. Do not turn on your computer while the 888/24 I/O is in stand-alone mode. If you do, the 888/24 I/O will stop functioning in stand-alone mode.

To use the 888/24 I/O as a stand alone A/D converter:

1. Disconnect any digital devices that produce a word clock signal from the 888/24 I/O's channel 1-2 digital input ports. (You must do this if you wish to use the 888/24 I/O as an analog-to-digital converter. Otherwise, the 888/24 I/O will detect the digital word clock signal and switch to digital input mode.)
2. With your computer off, turn on the 888/24 I/O.
3. The 888/24 I/O searches briefly for a Pro Tools card, or a word clock signal on channels 1-2 of its digital input ports.
4. If the 888/24 I/O does not detect either of these, it begins functioning as a stand-alone A/D converter using its internal clock. In this mode you will use analog inputs 1-8 and AES/EBU outputs 1-8.

To return the 888/24 I/O to Pro Tools-based operation:

1. Turn off the 888/24 I/O.
2. Turn on your computer.
3. Turn on the 888/24 I/O.

The default sample rate of the 888/24 I/O in stand alone A/D mode is 44.1 kHz. If you wish to change this default setting to 48 kHz, you must open the 888/24 I/O and manually reset it by moving an internal jumper switch. Instructions for doing this are provided in the 888/24 I/O Installation Guide. The 888/24 I/O Installation Guide also provides instructions for changing other stand-alone mode default parameters such as sample rate and DAC muting.

To use the 888/24 I/O as a stand alone D/A converter:

1. Make sure that a digital device providing a word-clock signal is connected to the AES/EBU inputs 1-2 of the 888/24 I/O and turned on.
2. With your computer off, turn on the 888/24 I/O.
3. The 888/24 I/O will take a moment to search for a valid word clock on channels 1-2 of its AES/EBU inputs.
4. When a valid word clock lock is recognized, the 888/24 I/O will enter digital sync mode and function as a stand-alone D/A converter using AES/EBU inputs 1-8 and analog outputs 1-8.

The 888/24 I/O's sample rate is determined by the sample rate that it detects on channels 1-2 of its AES/EBU inputs.

The 888/24 I/O defaults to "listening" to a digital word clock signal on channels 1-2 of its AES/EBU digital input ports. If you wish instead to use a S/PDIF device as your source of word clock, you must reset this default by opening the 888/24 I/O and moving an internal jumper switch. Instructions for doing this are provided in the 888/24 I/O Installation Guide. The 888/24 I/O Installation Guide also provides instructions for changing other stand-alone mode default parameters such as sample rate and DAC muting.

The 882/20 I/O Interface

The following section explains all of the connectors and indicators on the front and back panels of the 882/20 I/O Interface and how they are used.

882/20 I/O Interface Front Panel

The 882/20 I/O has the following front panel indicators, moving from left to right:

The front panel of the Digidesign 882/20 I/O

1. Power

This switch applies power to the 882/20 I/O. The "I" position is on. The "O" position is off.

2. Sync Mode

The Sync Mode LEDs indicate which sample rate clock reference is currently used by the analog-to-digital converters (ADC) and the digital-to-analog converters (DAC).

Internal This is the 882/20 I/O's standard setting. In this mode, the 882/20 I/O's sample rate is generated by its internal crystal oscillator (the internal clock frequency used is determined by the Sample Rate setting in the Hardware Setup dialog in Pro Tools. Internal mode should be active whenever the 882/20 I/O is NOT synchronized to an external clock source.

Digital This setting indicates that a S/PDIF word clock signal is the source for the 882/20 I/O's sample rate. This is the setting you would use for inputting material from DAT machines or other S/PDIF digital devices.

If you wish to use the 882/20 I/O's digital input and output as an effects send and return to a digital effects device, you should set the 882/20 I/O to Internal Sync Mode. You should then set the digital effects device to accept an external digital clock (the 882/20 I/O) so it synchronizes with Pro Tools.

In an expanded system, the system clock is carried by the Audio Interface connected to the first Pro Tools card in your system. This Audio Interface will act as the "master" interface in your system, and all other Audio Interfaces will be slaved to it.

Because some digital audio devices do not output proper clock when they are not playing back, leaving the 882/20 I/O in Digital Sync Mode may cause Pro Tools audio playback quality to suffer, or to play back at the wrong pitch. If you are using digital I/O with the Pro Tools hardware, always remember to reset the Sync Mode from Digital to Internal after inputting material. This can be done in the Session Setup window or in the Hardware Setup dialog.

Slave This LED is lit when the 882/20 I/O's sample rate is synchronized to another Digidesign Audio Interface or synchronization peripheral. In this mode, the sample rate of the "slave" interface is derived from the frequency of the incoming master clock signal present at the Slave Clock (256x) port. The 882/20 I/O automatically switches to this mode when a Slave Clock Out signal from another Digidesign Interface, Universal Slave Driver, Video Slave Driver, or SMPTE Slave Driver is connected to its Slave Clock In port.

In expanded Pro Tools systems, the Super Clock output of the master Audio Interface locks all other interfaces together with sample accuracy, keeping all signals phase-synchronous.

3. Ch 1-2 Input

This LED indicates the format (analog or digital) of the audio input signal to channels 1 and 2. In Pro Tools, you choose analog or digital input for these two channels in the Session Setup window or the Hardware dialog (in the Setups menu). Input channels 3 through 8 of the 882/20 I/O are always analog.

4. Sample Rate

These LEDs display the current sample rate of the 882/20 I/O internal crystal oscillator, which can be either 44.1 kHz or 48 kHz. In Pro Tools, this is set in the Session Setup window or in the Hardware Setup dialog.

The 882/20 I/O provides the following sample rates:

48 kHz This is a standard sampling rate of many professional audio devices. It is recommended for use with devices that cannot receive digital transfers at 44.1 kHz.

44.1 kHz This is the compact disc standard sampling rate and the Pro Tools default sample rate. In order to avoid the necessity of sample rate conversion (which can degrade sound quality) you should use this rate whenever you are recording material that will ultimately be published on a compact disc.

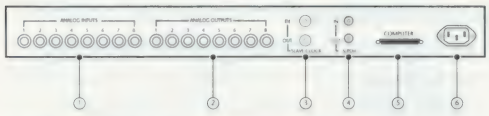
When you are using an external digital source such as a DAT machine, keep in mind that the sample rate indicated on the front panel of the 882/20 I/O reflects ONLY the 882/20 I/O internal oscillator sample rate, NOT that of the external DAT machine.

5. Signal Present LEDs

The 882/20 I/O Signal Present LEDs indicate whether or not signal is present (above the level of -30dB) at a given channel's output. Please note that these LEDs indicate the presence of channel output signals. Input signals are monitored within Pro ToolsPro Tools software. In addition, the meters on the 882/20 I/O do not indicate clipping. Clipping is indicated by the Pro Tools software on-screen meters.

882/20 I/O Back Panel

The 882/20 I/O has the following back panel connectors, moving from left to right:



The back panel of the Digidesign 882/20 I/O

1. Analog Audio Inputs

These are balanced, 1/4-inch TRS jacks for analog audio input connections. The 882/20 I/O's analog inputs feature 20-bit analog-to-digital converters. Input operating levels are switchable between

+4 dBu and -10 dBV operation via the "Other Options" button in the Pro Tools Hardware Setup dialog. Unbalanced connections are supported through the use of standard 1/4-inch TRS mono phone plugs. Because input channels 1-2 of the 882/20 I/O are software selectable between analog or S/PDIF digital format, input to these two analog channels is disabled when S/PDIF digital input format is chosen in the Pro Tools Hardware Setup dialog. The 882/20 I/O is factory calibrated at +14dBu headroom, yielding a maximum output level of +18dBu when in +4dBu operating mode. (When set to -10dBV operating mode, maximum output level is +4dBV.)

2. Analog Audio Outputs

These are balanced, 1/4-inch TRS jacks for analog audio output connections. The 882/20 I/O's analog outputs feature 20-bit digital-to-analog converters. All eight output channels are continuously active. Output operating levels are switchable between +4 dBu and -10 dBV operation via the "Other Options" button in the Pro Tools Hardware Setup dialog. Unbalanced connections are supported through the use of standard 1/4-inch TRS mono phone plugs. The 882/20 I/O is factory calibrated at +14dBu headroom, yielding a maximum output level of +18dBu when in +4dBu

operating mode. (When set to -10dBV operating mode, maximum output level is +4dBV.)

3. Slave Clock In/Out

The Slave Clock Out jack is a standard BNC type connector that outputs a 256x audio sample rate master "Super Clock" signal for slaving and synchronizing multiple Digidesign Interfaces and synchronization peripherals together.

The Slave Clock In jack is a standard BNC type connector designed to receive a Slave Clock Out signal from another Digidesign Interface, a Universal Slave Driver™, Video Slave Driver™, or SMPTE Slave Driver™ for synchronizing multiple Digidesign Interfaces and synchronization peripherals together.

When the 882/20 I/O Sync Mode is set to Internal, connecting a valid Slave Clock Out signal to this port will cause the 882/20 I/O to automatically switch to Slave mode. When the 882/20 I/O is the master interface or the first interface in a chain, Digital sync mode overrides the Slave Clock input, and an incoming Slave Clock Out signal will not switch the 882/20 to Slave mode.

4. S/PDIF Digital Input/Output

S/PDIF stands for Sony Phillips Digital Interface Format. This digital format is used in many professional and consumer CD players and DAT recorders. The 882/20 I/O's S/PDIF jacks are unbalanced, two-conductor, phono (RCA) jacks. Because input channels 1-2 of the 882/20 I/O are software selectable between analog or digital format, input to these two digital channels is disabled when analog input is chosen in the Hardware Setup dialog in Pro Tools. Output is continuously active on the S/PDIF output jack, even if the 882/20 I/O's input selector is set to Analog in the Hardware Setup dialog. To avoid RF interference, use 75-ohm coaxial cable for S/PDIF transfers and do not exceed a cable length of 10 meters.

5. 50-pin Interface Connector

This 50-pin connector is used to connect the 882/20 I/O to a d24, Disk I/O, or DSP Farm card. This cable is supplied with your Audio Interface.

6. Power Input

This connector accepts a standard AC power cable. The 882/20 I/O is auto power selecting (100 V-240 V), and will automatically work with a standard modular cable to connect to AC power receptacles in any country.

Making Signal Connections to the 882/20 I/O Interface

Depending on how you plan to use Pro ToolsPro Tools, the way you connect it to your studio will differ.

Choosing between +4dBu and -10dBV operation modes

The 882/20 I/O can be set to operate at +4dBu or -10dBV input and output levels. It is important to determine which line level mode is appropriate for your studio. In +4dBu operating mode, the 888/20 I/O is a 20-bit digital audio device capable of producing audio signals at or near +18dBu. Please check the owner's manual for your mixer, power amplifier or effects processor to see if it is equipped to handle this load. If it cannot, you should consider setting the 882/20 I/O to operate at -10dBV line levels.

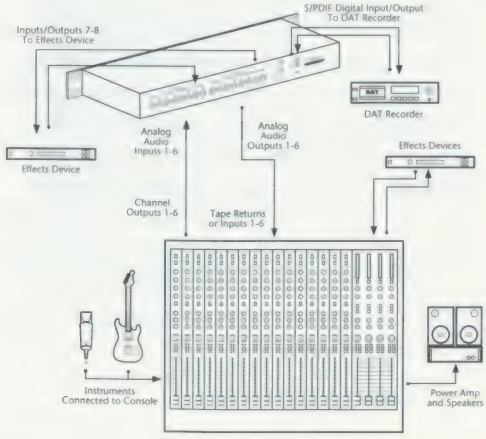
For example, consider the following figures when connecting a mixer:

- If your mixer cannot handle more than 1.5V (RMS) inputs at +4dB, then you should set the 882/20 I/O to run at -10 dBV line level.
- If your mixer can handle up to 8.5V (RMS) inputs, or has pads or attenuators on its inputs, then you can use the +4dBu setting on the 882/20 I/O.

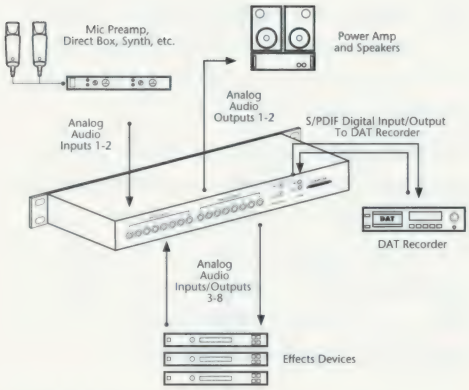
Most manuals contain device input specifications, including whether or not there are pads or attenuators. Consult the manufacturer of your mixer or power amplifier for further information.

Setting Up Your Studio

The following diagrams provide some general suggestions for connecting studio gear to your system. The first illustrates a studio setup with the 882/20 I/O connected to a mixing console, with effects and other gear routed into the console as well. The second diagram illustrates a setup without a mixer, where effects processors and monitoring gear are connected directly to the 882/20 I/O.



A typical studio configuration with mixer connections



A typical studio configuration without a mixer

Using the 882/20 I/O Interface as a Stand-Alone Audio Converter

The 882/20 I/O can be used apart from Pro Tools as a stand-alone 2-channel, 20-bit, analog-to-digital or digital-to-analog converter. This makes it extremely flexible in your studio.

The 882/20 I/O always operates at -10dBV when in stand-alone mode.

Before you use the 882/20 I/O in stand-alone mode:

1. Start with the 882/20 I/O turned off. If the unit is currently on, turn it off.
2. Do not turn on your computer while the 882/20 I/O is in stand-alone mode. If you do, the DigiSystem INIT (DSI) will initialize the 882/20 I/O, and it will stop functioning in stand-alone mode.

To use the 882/20 I/O as a stand alone A/D converter:

1. Power off any digital devices that may send a word clock signal to the 882/20 I/O's S/PDIF digital input.

(You must do this if you wish to use the 882/20 I/O as an analog-to-digital converter. Otherwise, the 882/20 I/O will detect the digital word clock signal and switch to digital sync mode.)

2. Turn on the 882/20 I/O. The 882/20 I/O searches briefly for a Pro Tools card, or a word clock signal on channels 1-2 of its digital input ports.
3. If the 882/20 I/O does not detect either of these, it begins functioning as a stand-alone A/D converter using its internal clock. In this mode you will use analog inputs 1-2 and the S/PDIF output.

In stand-alone mode, the 882/20 only operates at a 44.1kHz sample rate. If you wish to convert analog signals into 48kHz digital audio, you must launch Pro Tools (or any other software which supports the 882/20 I/O) to change the default sample rate.

To use the 882/20 I/O as a stand alone D/A converter:

1. Make sure that a digital device providing a word-clock signal is connected to the S/PDIF input of the 882/20 I/O and that the device is powered on.
2. 2. Turn on the 882/20 I/O. The 882/20 I/O will search for a valid word clock on its S/PDIF input.
3. 3. When a valid word clock lock is recognized, the 888/20 I/O will enter digital sync mode and function as a stand-alone D/A converter using the S/PDIF input and analog outputs 1-2.

The 882/20 I/O's sample rate is determined by the sample rate that it detects on its S/PDIF input.

To return the 882/20 I/O to Pro Tools-based operation:

- Turn on your computer.

  OR

- If your computer is on, launch Pro Tools, choose Playback Engine from the Setups menu in Pro Tools and select the 882/20 I/O interface.

Connecting a Pro Tools Audiomedia System

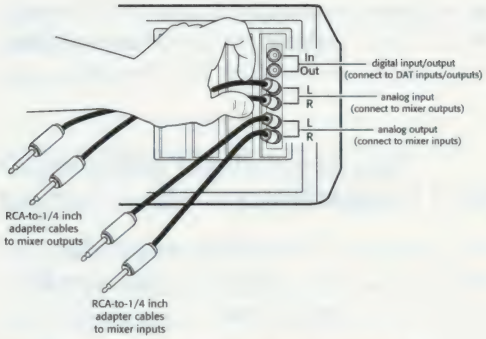
You can use Pro Tools with Audiomedia III in a variety of audio setups, including:

- a mixer, power amplifier, and speakers
- a mixer and a pair of amplified, self-powered speakers
- a stereo receiver and speakers
- a pair of amplified, self-powered speakers.

Your setup will differ depending on which of these systems you use with an Audiomedia III card. The illustrations that follow show a typical home studio setup consisting of a mixer, power amplifier and speakers.

To make audio connections to the Audiomedia card:

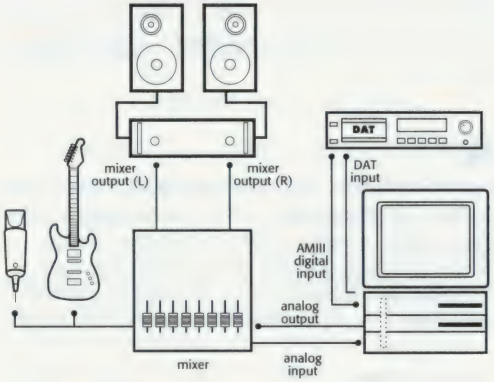
1. Turn down the volume on your playback system.
2. Connect your Audiomedia card's analog audio outputs to your mixer's inputs. The Audiomedia card's analog audio output jacks are standard -10 dBV unbalanced RCA connectors, and are the bottom white (for the left channel) and red (for the right channel) colored pair of RCA connectors in the rear of the card. Use the RCA cables provided with your Audiomedia card. If your mixer requires a 1/4 inch phone jack, use RCA to 1/4 inch adapters, available at most audio dealers.



Making audio connections to an Audiomedia card

3. Connect the Audiomedia card's analog audio inputs to your mixer's outputs. The Audiomedia card's analog audio inputs are standard -10 dBV unbalanced RCA connectors, and are the middle white (for the left channel) and red (for the right channel) colored pair of RCA connectors in the rear of the card. Use the RCA cables provided with your Audiomedia card. If your mixer requires a 1/4 inch phone jack, use RCA to 1/4 inch adapters, available at most audio dealers.
4. If you own a DAT (digital audio tape) recorder, connect your Audiomedia card's S/PDIF output to your DAT recorder's S/PDIF input, and your Audiomedia card's S/PDIF input to your DAT recorder's S/PDIF output. The S/PDIF jacks on both devices are standard RCA connectors. The Audiomedia card's digital input jack is the yellow-colored RCA connector and its digital output jack is the black-colored RCA connector.

Your system is now connected to your studio.



A typical studio setup for Pro Tools with an Audiomedia card

5

Connecting Pro Tools with DAE PowerMix to Your Studio

To use Pro Tools with DAE PowerMix, you will use the built-in audio input and output connectors of your Macintosh to bring audio into and out of your system. You can use Pro Tools with DAE PowerMix in a variety of audio setups, including:

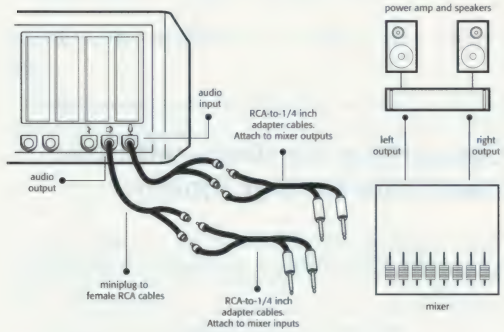
- a mixer, power amplifier, and speakers
- a mixer and a pair of amplified, self-powered speakers
- a stereo receiver and speakers
- a pair of amplified, self-powered speakers.

Your setup will differ depending on which of these systems you use with Pro Tools with PowerMix. The illustrations that follow show a typical "home studio" setup consisting of a mixer, power amplifier and speakers.

The audio input and output jacks on some Macintosh models are standard mini-plug (1/8-inch) connectors. Other Macintosh models provide RCA-type connectors. Most source inputs and outputs are either 1/4-inch "phone" connectors, or RCA connectors. If your Macintosh audio input and output jacks are mini-plug

connectors, you may need to use a 1/4-inch to mini-plug or RCA to mini-plug cable or adapter to make audio connections.

Some professional mixing consoles and other audio sources may have a nominal output level of +4dBu, while the Macintosh expects a nominal -10dBv level. You may need to adjust your mixer's output levels accordingly to prevent overloading the Macintosh's input. Alternatively, you may need to use a "+4dBu to -10dBv" line-matching transformer.



Using RCA-to-1/4 inch adapter cables to make audio connections

To make audio connections to a Power Macintosh:

1. Turn down the volume on your playback system.
2. Connect your audio source output to the Macintosh's audio input connector. Your audio source can be one of a variety of devices, including:

   - a mixer output

   - a cassette or DAT deck output

   - a stereo receiver line output (such as "tape deck record" output)

   - an instrument line output (such as the output of a synthesizer).
3. Connect your Macintosh's audio output to your playback system's input.
4. Raise the volume on your mixer or playback system.

Your system is now connected to your studio. Please refer to Chapter 6 to learn how to install and configure the software portion of your Pro Tools PowerMix system.

MIDI Connections

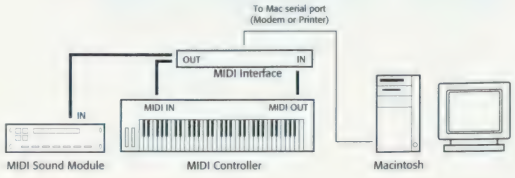
If you intend to use Pro Tools with external MIDI devices (such as sound modules, or a MIDI controller) they must be connected properly.

MIDI Data and the Macintosh Modem and Printer Ports

Digidesign has determined that on Power Macintosh computers, MIDI timing data output through the Macintosh's Printer port is not as accurate as MIDI timing data output through the Macintosh's Modem port. For this reason, we recommend that you connect your MIDI interface to the Modem port rather than the Printer port—especially if you are using MIDI Time Code, or devices such as the Digidesign ADAT Interface.

To connect MIDI devices to your system:

1. Connect the MIDI OUT of the MIDI controller to the MIDI IN of your MIDI interface.
2. Connect the MIDI interface to either the modem or printer port on the back of your Macintosh. Consult your MIDI interface's manual if you need more specific instructions. While the illustration below depicts a typical MIDI setup, you should follow the instructions supplied with your specific MIDI Interface.



A typical MIDI setup

Please refer to Chapter 7 to learn how to configure the software portion of your MIDI setup.

Connecting Equipment with Digital Audio Ins and Outs

Because the 888/24 I/O, 882/20 I/O, and Audiomedia III card feature digital inputs and outputs, Pro Tools allows you to digitally record to or from a digital device such as a DAT recorder. The 888/24 I/O provides both AES/EBU and S/PDIF digital audio input and output. The 882/20 I/O and Audiomedia III card provide S/PDIF digital audio input and output.

If you plan to use a DAT player, CD recorder, or other digital input and output device with your Pro Tools system, be sure the external device supports either the AES/EBU or S/PDIF format—your interface's AES/EBU inputs and outputs should only be connected to another AES/EBU device. Likewise, its S/PDIF inputs and outputs should only be connected to another S/PDIF device.

To connect your Pro Tools system to a DAT recorder:

1. Connect the digital output of the Audio Interface or Audiomedia III card to the digital input of the DAT deck. Audio channels 1 and 2 will be sent out of these outputs.
2. Connect the digital output of the DAT to the digital input of the Audio Interface or Audiomedia III card. The DAT recorder will be routed to Pro Tools inputs 1 and 2.

Connecting Effects Units

(Pro Tools 24, Pro Tools III, and Project Systems)

The 888/24 I/O and 882/20 I/O Audio Interfaces allow you to connect effects units to your system by using any analog (or digital) inputs/outputs as auxiliary inputs/outputs for effects sends and returns. Once an effects unit is attached in this way, you can send a variable amount of a track to the effects unit using an on-screen Send fader in Pro Tools' Mix or Edit window. Up to 5 send controls on any of 32 internal busses are available for each track. Outputs can be returned to mono or stereo auxiliary inputs for mixing and processing.

When using an effect in this send-type of configuration, make sure the unit's internal mix or balance between direct (or dry, unprocessed) and wet (or effected signal) is set so that only the processed signal is sent out to the Audio Interface. On most effect units, a balance setting of 100% (completely "wet") is the appropriate setting.

If you've been using an effects unit in an instrument setup, such as a guitar effects rack, you'll probably find the balance to be below 50%. If the unit has separate dry and effect level knobs, turn dry level control off. If you don't do this, the dry, unprocessed signal will be present in an effect's output along with the desired processed sound, and you'll have trouble accurately controlling the effect balance in your final mix.

Connecting Effects Units Digitally

If you wish to use your Audio Interface's inputs and outputs as effects sends and returns to a digital effects device, you should set your interface to Internal Sync Mode (unless it is already synchronized to an external clock source such as a DAT deck). You should then set your digital effects devices to accept an external digital clock so that they will synchronize themselves to Pro Tools. In Pro Tools' Hardware Setup dialog, set the input of the channel pair to which you have connected

the digital effects device to Digital, and set the Sync Mode to Internal.

Connecting SMPTE Synchronization Devices

If you intend to synchronize Pro Tools to external devices with SMPTE (via MIDI Time Code), your system must be connected properly. This section suggests three possible setups for synchronizing Pro Tools to audio or video tape. For a more complete discussion of SMPTE and synchronization, refer to the Working with SMPTE chapter of your Pro Tools Reference Guide.

The Pro Tools software supports a type of SMPTE synchronization known as SMPTE Trigger through the use of SMPTE-to-MIDI Time Code converters. This type of synchronization allows Pro Tools to chase and start (or stop) playback and recording while slaved to other systems. With SMPTE Trigger alone, once playback or recording starts, there is no further synchronization, and Pro Tools will play back at a rate determined by your Audio Interface's quartz crystal oscillator.

For fairly short pieces of audio program material, SMPTE Trigger is acceptable, especially if the sync master has a fairly stable transport or is resolved to house sync or a black burst generator. In this case, the master transport and Pro Tools will probably not drift very far apart in such a short period of time. On the other hand, if the audio piece is several minutes long, or if the sync master has an unstable transport (as in the case of a low quality recording deck striped with SMPTE, for example), SMPTE Trigger alone is probably not an acceptable solution, since the two systems may drift apart noticeably over the duration of the source material.

Three better alternatives exist, each of which uses hardware synchronization peripherals from Digidesign.

The Digidesign Video Slave Driver

The Video Slave Driver is a peripheral device for Pro Tools that allows you to control Pro Tools' recording and playback clock via an external video black burst or word clock signal while Pro Tools triggers to external Time Code via an MTC converter. The Video Slave Driver accepts either of these signals and then converts it into a master 256x sample rate "Super Clock" signal which it sends to your Audio Interface. By sending the same master black burst clock signal to Pro Tools and your video deck or synchronizer system, all elements of your system will run at exactly the same speed, thereby staying in sync.

In this case, SMPTE Time Code is only used to locate, chase, and trigger playback or recording via an MTC converter. As explained above, playback speed of both Pro Tools and the video tape or synchronizer are then resolved by the black burst or word clock signal. Since with the Video Slave Driver Pro Tools and all audio and video transports are resolved to a common clock, long-term synchronization is achieved. For applications which require high fidelity, and long-term synchronization to free-running SMPTE time code, Digidesign provides another alternative in the form of the SMPTE Slave Driver.

The Digidesign SMPTE Slave Driver

The SMPTE Slave Driver is a peripheral device for Pro Tools that provides high-fidelity direct hardware synchronization between Pro Tools and external Longitudinal Time Code (LTC) as well as functioning as a MIDI Time Code (MTC) converter. The SMPTE Slave Driver accepts an external longitudinal SMPTE time code signal and then converts it into a master "Super Clock" clock signal which it sends to your Pro Tools Interface. The SMPTE Slave Driver monitors any variations in rate of the external time code. Then, via the Super Clock connection between the SMPTE Slave Driver and the Audio Interface, Pro Tools' actual sample clock rate is varied directly by the SMPTE Slave Driver.

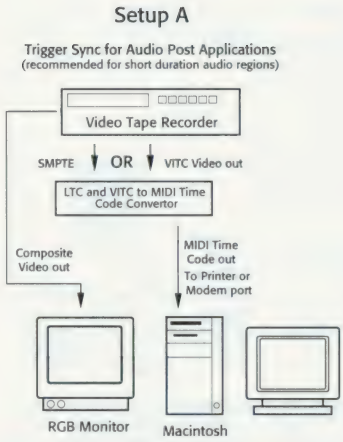
This uses none of Pro Tools' audio processing power, thereby preventing the audio degradation common to other software-based varispeeding schemes.

In addition, since a hard disk digital recording system such as Pro Tools is a much more stable timebase reference than a tape recorder, the SMPTE Slave Driver is also designed to generate LTC, allowing Pro Tools to function as a very stable master sync source. Thus the SMPTE Slave Driver can function as both a SMPTE-to-MTC converter and as a SMPTE and MTC generator.

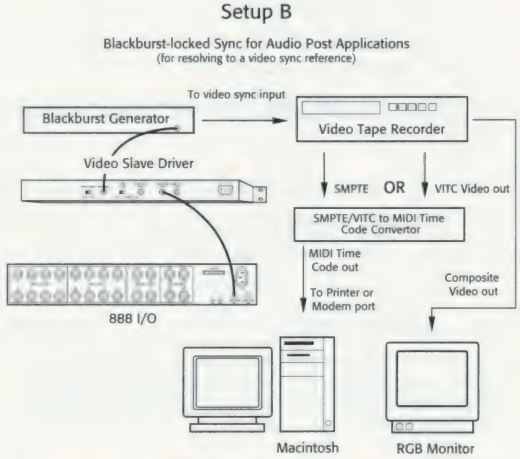
The Universal Slave Driver

The Universal Slave Driver is a peripheral device for Pro Tools that integrates the functions of both the SMPTE Slave Driver and the Video Slave Driver, plus adds many other functions. These include the ability to read and write VITC, and the ability to insert a Window Burn onto a video signal. In addition, the Universal Slave Driver offers extremely fast lockup, near-sample accurate synchronization, and an exceptionally low-jitter clock. These features provide professional performance and maximum audio fidelity, under a wide range of synchronization conditions.

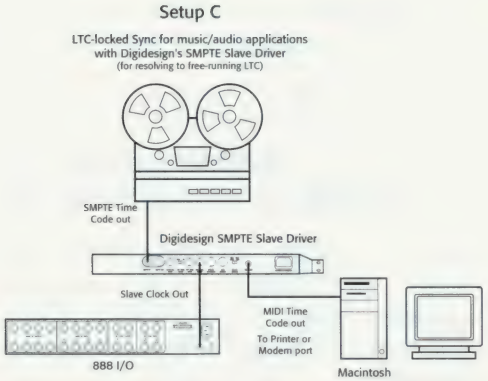
The synchronization setups explained above are shown in the following illustrations.



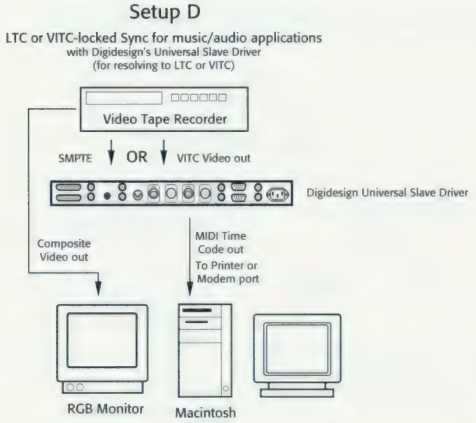
A synchronization setup for audio post production using SMPTE Trigger alone



A synchronization setup for audio post production using the Digidesign Video Slave Driver to lock Pro Tools to a black burst generator's clock signal



A synchronization setup for audio/music applications using the Digidesign SMPTE Slave Driver for resolving with high-fidelity to a free-running longitudinal SMPTE time code signal



A synchronization setup for audio/music applications using the Digidesign Universal Slave Driver for resolving with high-fidelity to a free-running VITC or longitudinal SMPTE time code signal

Refer to Chapter 7 for information on configuring the software portion of your synchronization setup.

Calibrating the 888/24 I/O with Calibration Tool™

Before you begin using the 888/24 I/O Audio Interface, you may wish to calibrate its input and output levels to the level of your mixing console. The Calibration Tool utility which is included with Pro Tools helps simplify aligning the audio levels of your 888/24 I/O.

The 888/24 I/O is factory-calibrated so that its input operating level is set to +4 dB nominal with 20 dB headroom nominal at full code, unity gain, making calibration unnecessary for most professional applications. If however, you do need to recalibrate your interface or other components of your studio, you can use the alignment procedure described here.

Calibrating levels of a digital recording device is somewhat different from calibrating the levels of an analog recording device. One significant difference lies in the fact that unlike analog devices, most digital devices do not have a standard "0 VU" level setting that corresponds to nominal input and output levels. Instead, with an interface such as the 888/24 I/O, the meters are calibrated in decibels below peak (digital clipping) level.

In other words, while analog devices allow for a certain amount of headroom above 0 VU, digital devices do not. So, if you send a signal above the 0 VU level to an analog recorder, you still have a margin of headroom, and if tape saturation occurs, it does so fairly gracefully, giving the audio a "compressed" sound that some people find desirable. However, when digital recorders receive signal above 0 VU, they immediately begin to clip—introducing digital distortion which is unacceptable.

To calibrate the input level of an analog machine to a mixing console's output level, you would send a 1 kHz tone at 0 VU from the console to the analog deck and align the recording deck's meters to read 0 VU. With a digital recording device such as the 888/24 I/O, however, in order to have headroom, you must align a 0 VU

tone from the console to less than zero on the 888/24 I/O by exactly the amount of headroom that you want.

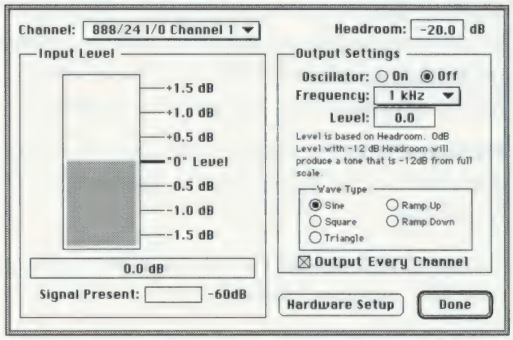
For example, to have 12 dB of head room above 0 VU with the 888/24 I/O, you must align the incoming 0 VU 1kHz tone to -12 dB. For 20 dB of headroom, you would align it to -20 dB, and so on. (Since it is assumed that you are using the 888/24 I/O with a +4 dBu console, a 0 VU signal level coming out of the console is actually equivalent to a nominal +4 dBu level signal.)

The AES (Audio Engineering Society) standard for headroom is currently -20 dB for nominal level in a digital audio system. The exact value you use will be determined by the amount of headroom available in the rest of your system. For example, if your mixing console has 15 dB of headroom above nominal level, then you may wish to calibrate the 888/24 I/O to have 15 dB of headroom.

The Calibration Tool utility helps simplify aligning the audio levels of your 888/24 I/O.

Calibration Differences Between the 888/24 I/O and 882/20 I/O Interfaces

The 888/24 I/O has a factory preset calibration of +4 dBu and 20 dB of headroom. The 882/20 I/O, however, is a unity gain device with headroom of 14 dB. In addition, the 882/20 I/O's inputs are not adjustable. When setting up an 882/20 I/O (particularly in systems using a combination of the 882/20 I/O and 888/24 I/O), make sure that the Calibration Tool's headroom is set to -14 dB. When setting up a +4 dBu system, set the headroom for the 882/20 I/O to -14 dB in the Calibration Tool. This adjustment ensures that recorded files have the same relative levels (regardless of which interface they are recorded with).



The Calibration Tool software

The Calibration Tool has the following controls:

Channel Use this pop-up to select the input channel for the input level readings.

Input Level Use this as a graphic and numerical display of the dB level relative to the headroom you have specified on that particular interface. (In other words, the amount of dB below digital clipping, or the amount of analog headroom you wish to use in your system.)

Signal Present This indicates when a -60 dB signal relative to the headroom is present at the input.

Headroom Use this field to enter an amount of headroom between your 0 dB level and the 888/24 I/O's full scale digital value. Any values above the full scale digital value will cause digital clipping.

Oscillator Use this to turn the audio waveform generator on or off.

Frequency Click on this pop-up to select the output frequency of the audio waveform generator. You can choose a 100 Hz, 1 kHz, or 10 kHz signal.

Level Use this to select the output level relative to the Headroom for the audio waveform generator.

Wave Type Use this to select the type of audio waveform generated the waveform generator.

Output Every Channel If this option is selected and the Oscillator is on, every output will generate an audio

waveform signal at the selected frequency. If this option is not selected and the Oscillator is on, only the selected output Channel will generate the audio waveform signal. If the Oscillator is off, this option has no effect.

Hardware Setup Use this to choose which Digidesign audio interface and card you wish to adjust using Calibration Tool.

In order to align your system with this software, you must have one of the following:

- A device (such as sine wave or test tone generator) that can send a 1 kHz audio waveform wave into the 888/24 I/O at 0 VU.

  OR

- A device (such as a mixing console with accurate VU meters) that can measure the level of a 1kHz audio waveform produced by the 888/24 I/O.

If you have a sine wave generator that can produce a 0 VU 1 kHz tone, use the following calibration procedure:

To calibrate the 888/24 I/O with Calibration Tool using an external source:

1. Start the Calibration Tool application.
2. In the Headroom field, enter the amount of headroom you desire. The default setting for the 888/24 I/O is -20dB.
3. Send a 1kHz tone into the 888/24 I/O from your external source.
4. In the software, select 888/24 I/O 1 Channel 1 from the Channel pop-up menu. You should get some level in the on-screen level meter.
5. Adjust the 888/24 I/O's Channel 1 Input Level trim pot by inserting a screwdriver into the Input Level trim pot and turning it until the Calibration Tool's on-screen meter reaches 0 VU and the numeric readout says 0.0 dB. The input is now aligned.
6. Repeat this procedure for each 888/24 I/O input by selecting them from the Channel pop-up menu and adjusting the appropriate front panel Input Level trim pot on the 888/24 I/O.
7. When you have finished aligning the inputs, connect each output of the 888/24 I/O directly to its input: Connect Channel 1 output to Channel 1 input, and so on.
8. Select 1kHz from the oscillator Frequency pop-up menu, and turn the oscillator on by clicking On.
9. Choose 888/24 I/O 1 Channel 1 from the Channel pop-up. Adjust the Output Level trim pots by inserting the Phillips screwdriver into the pot and turning it until the on-screen meter reaches 0 VU and the numeric readout says 0.0 dB.
10. Repeat this procedure for each Audio Interface output.

This completes the 888/24 I/O alignment procedure.

If you don't have a sine wave generator or another way to send a 1 kHz tone into the 888/24 I/O at 0 VU, a second alternative is to measure the output level of the 888/24 I/O with a VU meter, such as the kind found on a professional-quality mixing console. To do this, be sure that the outputs of the 888/24 I/O are connected to the VU meters of the console or other device. (On most consoles these inputs are usually the tape returns, or possibly the line inputs.)

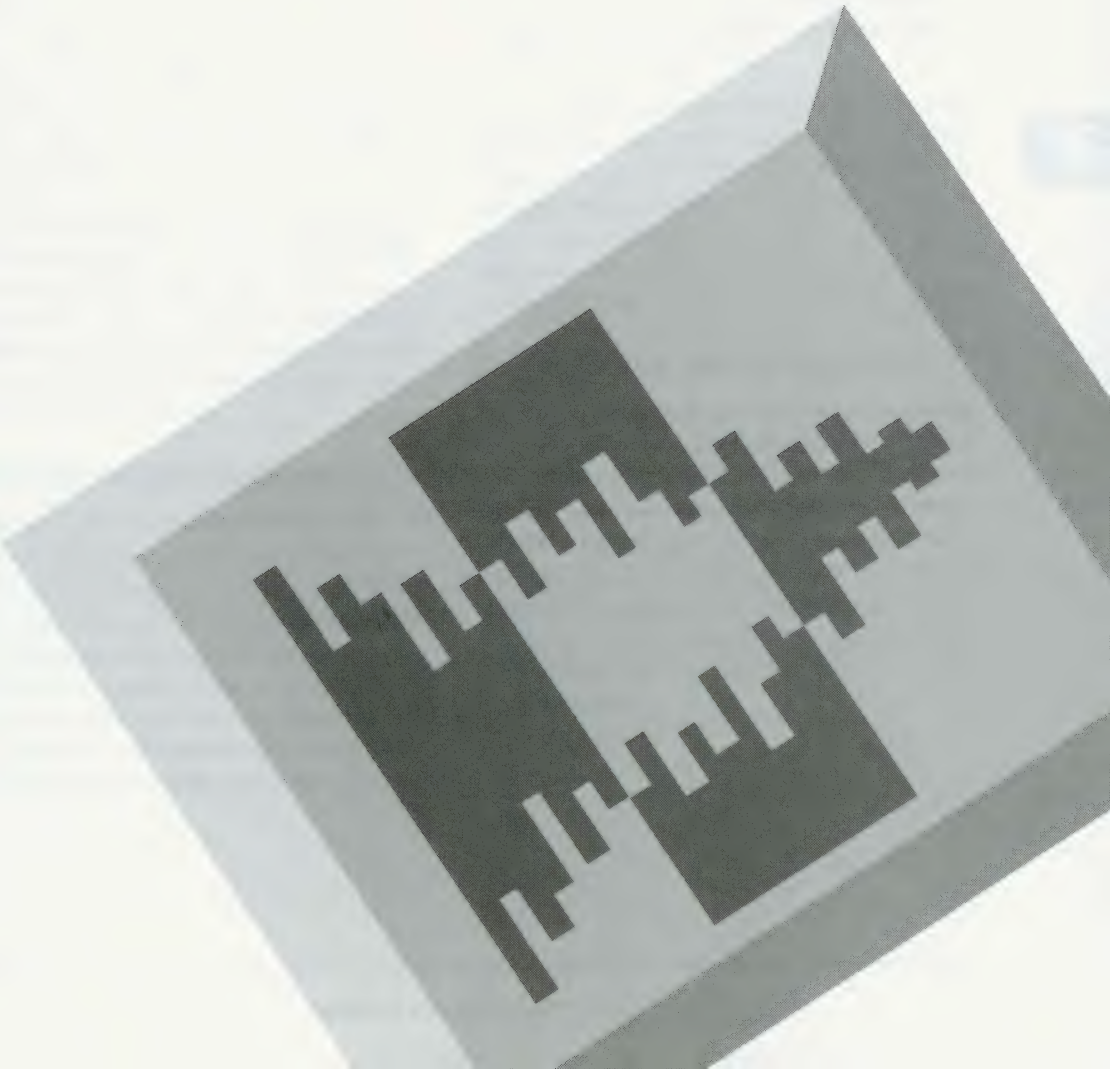
To calibrate the 888/24 I/O with Calibration Tool using an external VU meter:

1. In the Calibration Tool software, select 1 kHz from the Frequency pop-up menu and click the oscillator setting to On.
2. Adjust the 888/24 I/O's Output Level trim pots with a Phillips screwdriver to align the outputs to read "0 VU" on your console's meters.
3. After you have done this, connect each output of the 888/24 I/O directly to its input: Connect Channel 1 Output to Channel 1 Input, and so on for each channel.

4. To align the inputs, select 888/24 I/O 1 Channel 1 from the Channel pop-up menu. Adjust the 888/24 I/O's Input Level trim pot with the screwdriver until the on-screen meter reaches "0 VU". This input is now aligned.
5. Repeat this procedure for each input.

This completes the 888/24 I/O alignment procedure.

Installing Pro Tools Software



Chapter 6

Installing Pro Tools Software

Installing the Pro Tools Application

Your Pro Tools system comes with the following software components:

- Pro Tools 4.2 Installer CD-ROM
- Pro Tools Authorizer diskette

Pro Tools is copy-protected with a key disk protection scheme. Once you have installed Pro Tools software from CD-ROM, the Pro Tools Authorizer diskette permits you to "authorize" and use a single copy of the Pro Tools application.

Once you have authorized Pro Tools to run on your hard disk, you can open, use, and even move it to different locations on that hard disk without ever being prompted for your master disk. The Pro Tools Authorizer diskette also permits you to reclaim this authorization from your hard disk if you wish to install and run Pro Tools on a different hard disk.

Register Your Pro Tools Software

When you send in the Pro Tools Registration Card included with your system, Digidesign Customer Services will mail you a diskette containing an additional authorization key for your Pro Tools software. As a registered user you'll also receive periodic software updates and notification of upgrades. If you are an international customer, please consult the list of international distributors included with your system for registration. Don't delay. Send in your Registration Card today.

If You Plan to Work With MIDI

Pro Tools 4.2 requires version 2.3.2 or higher of Opcode Systems' OMS (Open Music System) for MIDI-related interapplication communication, synchronization to external devices, and support for MIDI interfaces and other MIDI devices.

The Pro Tools Installer will automatically copy the OMS Installer to your hard drive (unless you specifically choose not to). After you install Pro Tools, you must run the OMS installer to install OMS.

Once you have done this and restarted your computer, the first time you open Pro Tools you will be prompted to configure your OMS MIDI setup. Instructions for doing this are contained in Chapter 7 of this Installation Guide. At the appropriate point in your installation, please refer to the section entitled "Preparing Your Pro Tools MIDI Setup to Work with OMS" in that chapter.

Do Not Rename Your System Folder!

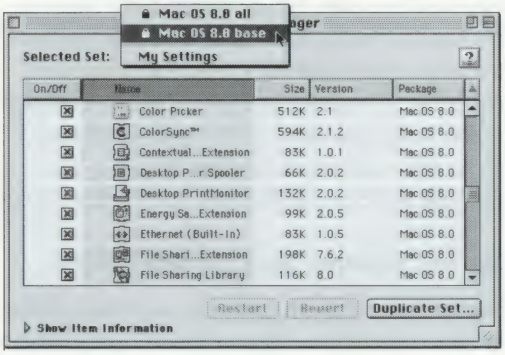
The Pro Tools installer requires that your System Folder be named exactly that—"System Folder." Do not rename your System Folder, or the Installer will create a second System Folder containing the Pro Tools Extensions and Control Panels. You will then have to manually move these files into the correct System Folder. If you are running a non-U.S. version of the MacOS, you can run the Installer and then move the files from the installer-created System Folder to their proper locations in your true System Folder.

Enable The Default Set of Mac OS System Extensions

Pro Tools requires that certain essential Mac OS System Extensions be enabled in order to run properly. Before you install Pro Tools software, use the Extensions Manager Control Panel to activate the default set of Mac OS System Extensions. It is important that you do this prior to installing Pro Tools.

To enable the default set of Mac OS Extensions:

1. Choose the Extensions Manager Control Panel from the Apple Menu.
2. When the Extensions Manager appears, choose Mac OS 8.0 Base from the Selected Set pop-up.
3. Click the Restart button to restart your computer.


Mac OS 8.0 all
Mac OS 8.0 base
My Settings
Selected Set:
On/Off
Name
Size
Version
Package
Color Picker 512K 2.1 Mac OS 8.0
ColorSync™ 594K 2.1.2 Mac OS 8.0
Contextual...Extension 83K 1.0.1 Mac OS 8.0
Desktop P...r Spooler 66K 2.0.2 Mac OS 8.0
Desktop PrintMonitor 132K 2.0.2 Mac OS 8.0
Energy Sa...Extension 99K 2.0.5 Mac OS 8.0
Ethernet (Built-In) 83K 1.0.5 Mac OS 8.0
File Shari...Extension 198K 7.6.2 Mac OS 8.0
File Sharing Library 116K 8.0 Mac OS 8.0
Restart
Revert
Duplicate Set...
Show Item Information

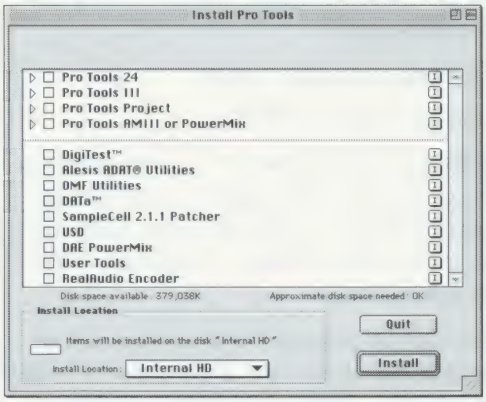
The Extensions Manager Control Panel

Turn Off Virtual Memory

Pro Tools also requires that the Macintosh's Virtual Memory feature be turned off. To turn this off, open the Memory Control Panel and click the Off button under Virtual Memory. Then restart your computer.

To install Pro Tools software on your computer:

1. If you are using virus-protection software, turn it off or temporarily remove it and restart your Macintosh.
2. Insert the Pro Tools 4.2 Installer disc in your CD-ROM drive and double-click the file named "Install Pro Tools."
3. When the Installer screen appears, click Continue to proceed. This window appears:



The Pro Tools Installer

4. Select the hard disk on which you wish to install Pro Tools using the Switch Disk button. For maximum reliability, we recommend that you install to your Startup hard drive, or a drive that is connected to the Macintosh SCSI bus. If you install Pro Tools on a hard drive that is connected to a Pro Tools Disk I/O or Project card, you will be able to run or deauthorize Pro Tools only when the hard drive is connected to that card. If you later connect the drive to the Macintosh SCSI bus, the copy protection key will not be recognized and Pro Tools will not run without prompting you for the key disk. Avoid installing Pro Tools to drives that are connected to other third-party SCSI cards as they may cause you to lose disk authorizations.
5. Four different installation packages are available. Clicking on the triangle next to each package will

reveal all items in that package. Clicking the information (i) button will display a description of what each item does and whether it is required. Don't deselect (uncheck) items from these packages unless you know exactly what you are doing—if you skip any essential items, your system may not function correctly. Choose the preconfigured install option appropriate to your particular system:

- If you have a Pro Tools 24 system, choose the Pro Tools 24 option.

- If you have a Pro Tools III system, choose the Pro Tools III option.

- If you have a Pro Tools Project system, choose the Pro Tools Project option.

- If you do not have Pro Tools hardware, or if you are using an Audiomedia card, choose the Pro Tools with PowerMix/Audiomedia option.

In addition, several optional items are listed directly below the main installation choices. If you wish to install any of these, simply click the appropriate checkbox:

DigiTest™ Add this to your installation if you wish to be able to run diagnostic tests on your Pro Tools cards. This utility can also be used to determine the slot numbering of your computer. See the section entitled, "Using DigiTest as a Diagnostic Tool" later in this chapter for instructions on how to use DigiTest.

Alesis ADAT Utilities Add this to your installation if you own Digidesign's original ADAT Optical Interface. (Users of Digidesign's new ADAT Bridge I/O™ do not need to install the Alesis ADAT utilities.)

OMF Utilities Add this to your installation if you are an OMF (Open Media Framework) user.

DATa Add this utility to your installation if you wish to be able to back up Pro Tools sessions on DAT tapes.

SampleCell 2.1.1 Patcher Add this to your installation if you own a Digidesign SampleCell card and wish to update the SampleCell Editor software from version 2.1 to version 2.1.1 for use with Pro Tools.

USD Add this to your installation if you own a Digidesign Universal Slave Driver™. This option installs the Universal Slave Driver Setup™ application, which allows you to access and control the parameters of that synchronization peripheral via your computer.

DAE PowerMix Add this to your installation if you have a Power Macintosh and wish to have the capability to use Pro Tools without your Pro Tools hardware. This allows you to obtain a greater number of tracks (up to 16) if you have a Pro Tools Project or Audiomedia III-based system.

User Tools Add this to your installation if you would like a multimedia-based tutorial introduction to several of Pro Tools' main features and functions.

RealAudio Encoder Add this to your installation if you wish to have the capability to encode Pro Tools audio files in RealAudio™ format.

6. Select the desired option for installation and click Install. Pro Tools will be installed in a folder named "Digidesign" on your hard disk. DAE will be installed in a folder named "DAE Folder" within the System Folder. The AudioSuite Plug-Ins will be installed in a folder named "Plug-Ins" within the DAE Folder. The PowerMix Extension will be installed a folder named "DAE Extensions" within your DAE Folder. Also, the DigiSystem Init will be installed in your Extensions folder. Other items will be installed as needed.
7. During installation, the Installer will prompt you to insert the Pro Tools Authorizer Disk. This diskette allows you to place an authorization key on the hard disk on which you installed Pro Tools. If you don't do this, you will have to insert your authorizer diskette each time you open Pro Tools on that disk.
8. When authorization is complete, a dialog will appear indicating that the installation was successful. This dialog contains three buttons: Quit, Continue, and Restart.

9. To install OMS, click Quit (not Restart). Refer to the instructions in the section that follows for installing OMS.
10. If you wish to install Pro Tools on another hard disk, click Continue and perform additional installations.
11. If you do not wish to install OMS, and are finished with your Pro Tools installation, click Restart to restart your Macintosh. You must do this before you can use Pro Tools. After restarting, don't forget to turn back on any virus-protection software that you may be using.

OMS is required for synchronization to external devices such as tape machines via SMPTE time code. Even if you are not using MIDI for other purposes, remember that you must install and configure OMS if you wish to synchronize to other devices. (An exception to this rule is if you are using a Digidesign Universal Slave Driver. This device allows you to achieve synchronization through via a serial connection, without OMS.)

After restarting, you should use the Demo Session Installer to install the Pro Tools Demo session. You will use this session to confirm that your system is working properly. Installation of the Demo Session is explained in the section entitled "Making Sure Your System Is Working Properly."

Installing OMS

Pro Tools 4.2 requires version 2.3.2 or higher of Opcode Systems' OMS (Open Music System) for MIDI-related interapplication communication, synchronization to external devices, and support for MIDI interfaces and other MIDI devices.

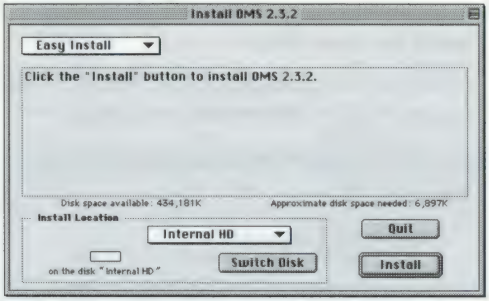
The Pro Tools Installer will automatically copy the OMS Installer to your hard drive (unless you specifically choose not to). After you install Pro Tools, you must install OMS.

Once you have done this and restarted your computer, the first time you open Pro Tools you will be prompted to configure your OMS MIDI setup. Instructions for doing this are contained in Chapter 7 of this Installation Guide. At the appropriate point in your installation, please refer to the section entitled "Preparing Your Pro Tools MIDI Setup to Work with OMS" in that chapter.

The OMS Installer

To Install OMS:

1. Double-click the Install OMS 2.3.2 application
2. A dialog appears. Click Continue
3. The Install OMS dialog appears. Select the hard drive that contains your System Folder and click Install.



The OMS Installer

4. A dialog appears asking about the type of MIDI interface you are using. Click Yes or No depending on whether or not you are using one of the MIDI interfaces listed here.
5. A dialog appears reminding you to restart you computer after installation. Click Continue. The Installer installs OMS on your hard drive.
6. When installation is complete, click Restart to restart your computer.

You should now install the Pro Tools Demo Session. Refer to the section entitled "Making Sure Your System is Working Properly" for instructions.

The first time you open Pro Tools you will be prompted to configure your OMS MIDI setup. Instructions for doing this are contained in Chapter 7 of this Installation Guide. At the appropriate point in your installation, please refer to the section entitled "Preparing Your Pro Tools MIDI Setup to Work with OMS" in that chapter.

Making Sure Your System Is Working Properly

After you have installed your Pro Tools hardware and software, take a moment to make sure that your system is working properly. To do this you will install and play the Demo Session that was included on the Installer CD-ROM.

Before you install the Demo Session, you should have already connected your system to your mixing console according to the instructions given in Chapter 5. This is necessary in order for you to monitor Pro Tools' audio output and hear the demo file.

To get ready to test your Pro Tools system:

1. If you have a Pro Tools III or Pro Tools Project system, turn on the external SCSI hard drive (or drives) connected to your Pro Tools card(s). We'll call this drive your Pro Tools drive. Wait ten seconds or so until the drive comes fully up to speed. When you use any Pro Tools system, you should always turn on this drive (and any other external drives) first, before you start your Macintosh.
2. Turn on your Audio Interface if you have one.
3. If your Macintosh is currently on, restart it by choosing Restart from the Finder's Special menu. If it's not already on, turn it on now.
4. If you have a Pro Tools III or Pro Tools Project system, when the Macintosh desktop appears after fully starting up you should see a distinctive icon (a hard drive with a musical note) in the upper right corner of your screen. This icon represents your Pro Tools drive (the one that is connected to your Pro Tools card). You will install the Demo Session here. In Pro Tools III and Pro Tools Project systems, audio files and session files must always reside on drives connected to the Pro Tools card.

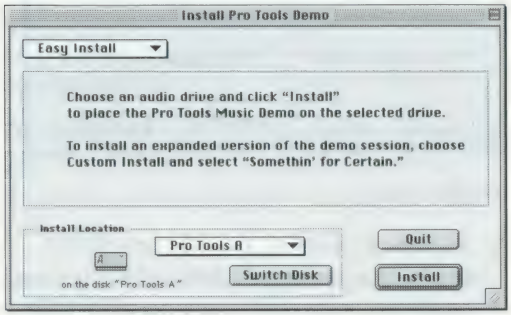
The Pro Tools Drive icon

5. Next, locate and open the Pro Tools Read Me file within the Pro Tools folder. This document contains any late-breaking Pro Tools news or features that were implemented after this Installation Guide and your Software User's Guide went to print.

Before you install the Demo Session, you must have already installed the Pro Tools hardware and software, (and if you are using a Pro Tools III or Project system, your Pro Tools Drive must appear on the Macintosh Desktop). If your Pro Tools Drive is not currently visible on the Macintosh Desktop, please refer to the troubleshooting section at the end of this chapter before continuing.

To Install the Demo Session:

1. Insert the Pro Tools 4.2 Installer disc in your CD-ROM drive.
2. Double-click the item named "Install Pro Tools Demo."
3. A pop-up menu allows you to perform an "Easy Install" or a "Custom Install." Choose the Easy Install option. This installs the small Pro Tools Demo Session you will use to test your system. Later, if you wish, you can use the Custom Install option to install a second, larger Demo Session which utilizes more capabilities of your Pro Tools system.
4. Next, choose a drive on which to install the Demo. If you have a Pro Tools III or Pro Tools Project system, click Switch Disk and choose a drive that is connected to a Pro Tools card. Do not choose any other drive or you will not be able to open the Demo Session on these systems.
5. In the Installer dialog, click Install. The Installer installs the Demo Session.
6. A dialog appears, notifying you that installation was successful. Click OK to return to the Finder.


Install Pro Tools Demo
Easy Install
Choose an audio drive and click "Install"
to place the Pro Tools Music Demo on the selected drive.
To install an expanded version of the demo session, choose
Custom Install and select "Somethin' for Certain."
Install Location
Pro Tools A
A
on the disk "Pro Tools A"
Switch Disk
Quit
Install

The Demo Installer

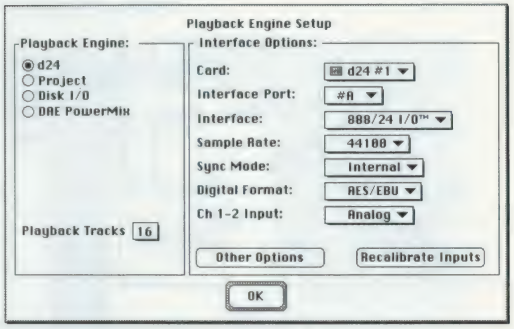
When the installation is complete, you're ready to open the Demo Session.

Before you open the Demo Session, be aware that if this is the first time you have opened Pro Tools since installing it, you will be prompted to configure OMS. Since the Demo Session contains no MIDI data, we suggest that when the "OMS" dialog appears, you click "Cancel" and open the Demo Session without configuring MIDI at that time. Instead, after you have played the Demo Session and confirmed that your system is working properly, refer to Chapter 7, which provides complete instructions on how to configure your OMS MIDI setup.

To open the Demo Session:

1. If you have an Audio Interface, make sure that it is turned on.
2. Locate and open the Demo Session folder.
3. Locate and double-click on the file called Demo Session.
4. A dialog appears prompting you to use the Playback Engine Setup dialog to configure your system parameters.

5. Click OK. The Playback Engine Setup dialog appears.



The Playback Engine Setup dialog

6. Here you must configure the parameters for each Pro Tools card and Audio Interface in your system. If you have a system with multiple cards and/or interfaces, you must configure each by selecting the appropriate items from the pop-up menus in this dialog. This means you must select the card, then identify the interface connected to it, then finally set the parameters for that interface—repeating this for each card/interface in your system. (Please note that not all of the instructions and parameters explained apply to every Pro Tools configuration.)
7. From the Card pop-up menu, select the Digidesign card type (d24, Disk I/O, Project, DSP Farm, or Audiomedia III). Alternatively, click the DAE PowerMix radio button if you wish to use DAE PowerMix.
8. If you have a Pro Tools 24 system, use the Interface port pop-up to choose the port to which your Audio Interface is connected (port A or port B). Choose port A if only one Audio Interface is connected to your d24 card. If two Audio Interfaces are connected to your d24 card (via the optional Y adapter cable), you must follow the steps below for each port/interface. The Interface port pop-up menu does not appear unless you have a Pro Tools 24 system.
9. From the Interface pop-up, choose the appropriate Audio Interface model that is connected to the card you selected in the previous step. (If you have an Audiomedia III-based system, this choice will not appear.)
10. Click the Sample Rate pop-up to select the appropriate sample rate for the currently selected card and Interface (44100 or 48000 Hz).
11. Click the Sync Mode pop-up to select the appropriate sync mode on the currently selected Interface (Internal or Digital). In most cases you will use Internal. Digital is used primarily when you are inputting data from a DAT deck or other digital source.
12. Click the Digital Format pop-up to select the appropriate digital format of Channels 1-2 of the currently selected interface (AES/EBU or S/PDIF).
13. Click the Ch 1-2 Input pop-up to select the input format of Channels 1 and 2 of the currently selected Interface (Analog or Digital).

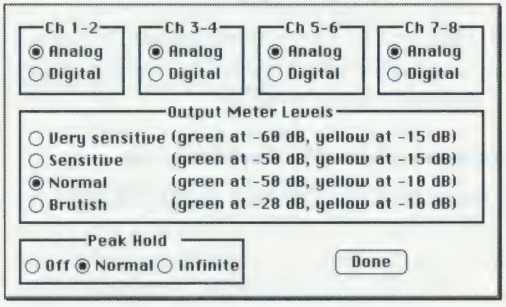
Configuring PowerMix Playback Tracks

If you are using DAE PowerMix, click the Playback Tracks pop-up at the bottom of this dialog to select the default number of tracks you wish to have in your sessions. This will become the default setting for all subsequent sessions until you change it again here. The maximum number of tracks available depends on the processor speed of your computer. The greater the number of tracks you choose, the greater the demand on your computer. To maximize performance, set the number of tracks no larger than you absolutely need. You can always increase the number of tracks later in the session with this pop-up.

Pro Tools with PowerMix cannot currently be operated at 48 kHz due to its dependence on the Power Macintosh's built-in hardware for signal acquisition and playback. Apple's hardware supports only a 44.1 kHz sample rate, and will not operate at 48 kHz.

Configuring the 888/24 I/O Audio Interface

1. If you have selected the 888/24 I/O as your Audio Interface, an Other Options button will appear in this dialog. Clicking the Other Options button will present you with a dialog in which you can set the input format (analog or digital) of each pair of input channels, and configure the level sensitivity and peak hold settings for the output level meters on the front panel of either of these Audio Interfaces. When you are finished, click Done.

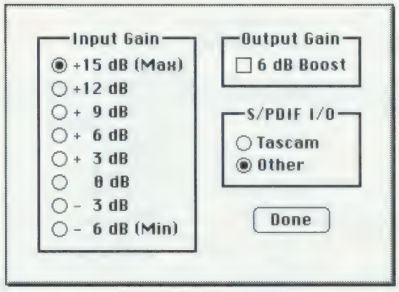


Setting input format for an 888/24 I/O with Pro Tools Project

2. Click OK to close the Playback Engine Setup dialog

Configuring the Audiomedia III card

1. If you are using an Audiomedia III card, the Other Options button will appear in this dialog. Clicking the Other Options button will present you with a dialog in which you can control the level of the analog input signal coming into the Audiomedia III card's analog inputs, boost the output gain of the Audiomedia III card by an additional 6 dB, and configure the Audiomedia III card's S/PDIF digital connectors for use with a Tascam DAT recorder. When you are finished, click Done.

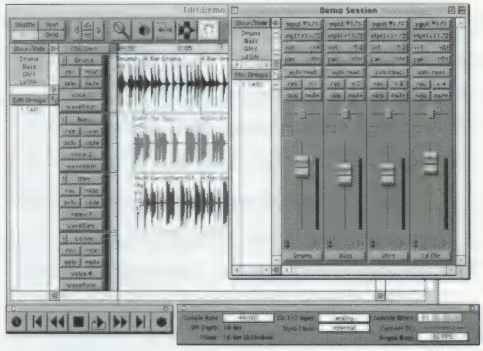


The Other Options dialog for Audiomedia III systems

If you are planning to record to or from a Tascam DAT recorder, you must first set the S/PDIF I/O type switch to the "Tascam" position. This allows the Audiomedia III card's S/PDIF data stream to match that of the Tascam DAT recorder. If you are using a Tascam DAT recorder and the S/PDIF I/O type switch is not set to the "Tascam" position, a noise burst or click may result when attempting a S/PDIF transfer from the Audiomedia III card to the Tascam DAT recorder, or vice-versa. If you are planning to record to or from a DAT recorder other than a Tascam DAT recorder, the S/PDIF I/O type switch should be set to "Other." (This is the default position.)

2. Click OK to close the Playback Engine Setup dialog.
3. If AppleTalk is currently on, a dialog will appear prompting you to turn it off.
4. If you have installed OMS, a dialog will appear prompting you to configure your OMS MIDI setup. Since the Demo Session contains no MIDI data, we suggest that when the OMS dialog appears, you click Cancel and open the Demo Session without configuring MIDI at this time. Instead, after you have played the Demo Session and confirmed that your system is working properly, refer to "Preparing Your Pro Tools MIDI Setup to Work with OMS" in Chapter 7 for complete instructions on how to configure your OMS MIDI setup.

5. Pro Tools will locate the correct audio files and the Demo Session will open. Your screen should look something like this:



The Demo Session

To play the Demo Session:

1. Adjust the volume control on your monitor system or mixing console so that it is set relatively low. You can adjust levels as the demo begins to play.
2. Press the Space bar on your Macintosh keyboard. You should hear the Demo Session begin to play. If you wish to stop playback, press the Space bar again.

Welcome to Pro Tools!

If for some reason you weren't able to play and hear the Demo Session, you may have skipped a step in your installation. To find the problem, refer to the Troubleshooting section that follows.

If you were able to successfully play and hear the Demo Session and intend to use MIDI with Pro Tools, please go immediately to Chapter 7 and refer to the section entitled "Preparing Your Pro Tools MIDI Setup to Work with OMS" for complete instructions on how to configure your OMS MIDI setup.

OMS is required for synchronization to external devices via SMPTE time code. Even if you are not using MIDI for other purposes, you must install and configure OMS if you wish to synchronize to other devices. (An exception to this rule is if you are using a Digidesign Universal Slave Driver. This device allows you to achieve synchronization through via a serial connection, without OMS.)

Selecting Your Operating Mode

(Pro Tools 24, Pro Tools III, and Pro Tools Project)

Pro Tools 24, Pro Tools III, and Pro Tools Project systems have two different operating modes, Direct Outputs mode and Stereo Mix Outputs mode. These modes allow you to configure Pro Tools to match your particular studio setup.

Systems with no audio interface, such as Pro Tools with DAE PowerMix and Pro Tools with Audiomedia, should always be used in Stereo Mix mode as they lack discrete hardware outputs.

Direct Outputs Mode

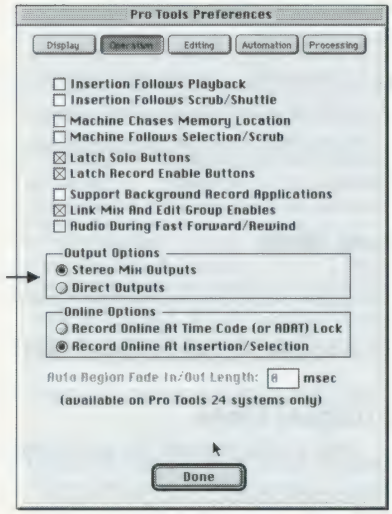
In Direct Outputs mode, track outputs are routed to a single Audio Interface output: 1, 2, 3, 4, 5, 6, 7, 8. Panning controls are not available in Direct Outputs mode.

Stereo Mix Outputs Mode

In Stereo Mix Outputs mode, track outputs are routed to a pair of Audio Interface outputs: 1-2, 3-4, 5-6, 7-8. Each track contains controls for panning between the selected output pair.

To choose an operating mode:

1. From the Setups menu, choose Preferences. When the Preferences dialog appears, click the Operation button. This dialog appears:
2. Choose the desired operating mode, Stereo Mix Outputs or Direct Outputs. If you choose Stereo Mix Outputs mode, track outputs are routed to pairs of Audio Interface outputs: 1-2, 3-4, 5-6, 7-8. If you choose Direct Outputs mode, track outputs are routed to a single Audio Interface output: 1, 2, 3, 4, 5, 6, 7, 8. Panning controls are not available in Direct Outputs mode.
3. After choosing your operating mode, click Done. To learn about the other options in the Preferences dialog, please see the Pro Tools Menus chapter in the Pro Tools User's Guide.



Choosing Pro Tools' operating mode

Configuring the Digidesign Sound Drivers

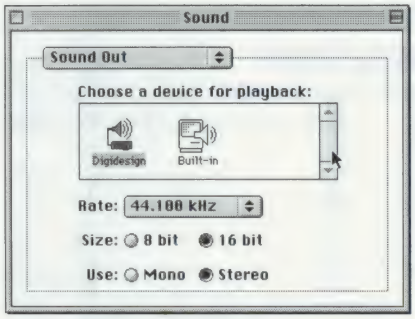
Pro Tools 24, Pro Tools III, and Pro Tools Project systems use the Macintosh's Sound Manager for auditioning crossfades and managing audio in Pro Tools' Convert & Import Audio dialogs. (Both of these functions are explained in the Pro Tools Reference Guide.)

Normally, the Macintosh Sound Manager routes audio to your computer's built-in speakers. However, Pro Tools allows you to bypass the Macintosh's speakers and route audio through your system's outputs using Digidesign's sound driver software. These sound drivers are installed automatically when you install Pro Tools, and must be configured properly in order for you to do this.

To configure the Digidesign Sound Drivers, you must use the Sound Control Panel. If this Control Panel does not currently appear in the Apple menu, you may need to install it. Mac OS 8.0 should have originally placed it in a folder called "Apple Extras" on your Startup Drive. Once you have located it, it drag it into the Control Panels folder within your System Folder and restart your computer.

To route Sound Manager audio through Pro Tools:

1. From the Apple menu, choose Control Panels and choose Sound from the sub menu. The Sound Control Panel appears.
2. Click the pop-up menu at the top of this window and choose Sound Out.



The Sound Out dialog

3. Select the Digidesign sound output device.
4. Set the audio format options appropriately. Audio will now be routed through your Pro Tools system's outputs.

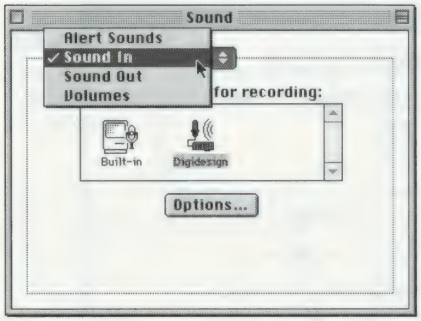
Because "system beep" sounds will also be sent through your Pro Tools system's outputs, you may wish to reduce their volume by choosing "Alert Sound" from the Sound pop-up menu and adjusting the volume slider.

Configuring the Sound Control Panel for PowerMix Systems

If you are using DAE PowerMix and no Digidesign hardware, you must configure your system's inputs and outputs with the Sound control panel. The Sound Control Panel controls the Macintosh Sound Manager and is where you configure the inputs and outputs of your computer.

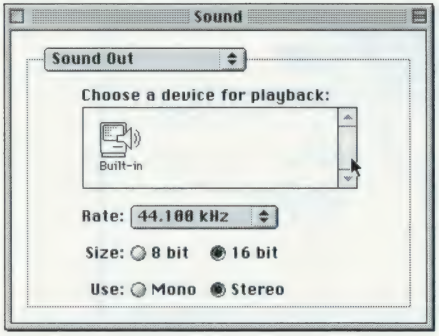
To configure the Macintosh's input and outputs:

1. From the Apple menu, choose the Sound Control Panel.
2. In the Sound control panel, choose Sound In from the pop-up menu at the top-left of this window.



3. In the Sound In window, select Built-In and then click the Options button.
4. Select the appropriate input depending on the type of Macintosh audio input your audio source is connected to, and then select Playthrough. Click OK when you have finished. This window may look different depending on your model of Macintosh and which version of the Macintosh System software you are using.

5. Next, choose Sound Out from the pop-up menu at the top-left of the Sound control panel.

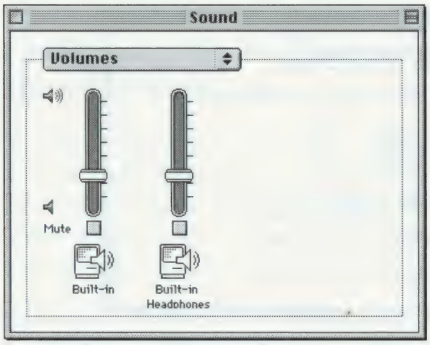


6. In the Sound Out window, select your desired playback sample rate ("Rate"). 44.1 kHz is the Compact Disc standard. This doesn't affect recording, only playback fidelity.
7. Select the playback bit resolution. The "Size" item allows you to set this parameter. 16-bit is the Compact Disc standard. Again, this doesn't affect recording, just playback. For best results, use the highest resolution that your Macintosh model allows.
8. Select mono or stereo format. The "Use" item allows you to set this parameter. We recommend Stereo.

To set the master output volume:

1. Choose Volumes from the pop-up menu in the top left corner of the Sound Control Panel.

Choosing Volumes in the Sound Manager



The Volumes window

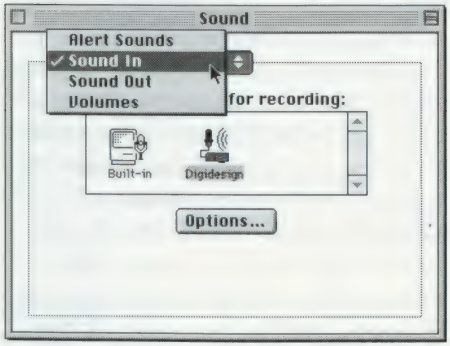
2. Drag the Built-In volume slider to maximum. This sets the master output volume for the Macintosh sound system. Leave the volume all the way up for maximum signal-to-noise fidelity.
3. Close the Sound Control Panel when you have finished. Your Macintosh is now ready for digital recording and playback with Pro Tools and DAE PowerMix.
4. If you wish to set your Macintosh "system beep" volume to a lower level than your main output volume, choose Alert Sounds from the pop-up menu in the Sound Control Panel and set the Alert Volume slider to a lower level. Your Macintosh's system alert sounds will have the level that you set here.

Configuring the Sound Control Panel for Audiomedia III and Third Party Applications

Audiomedia III-based Pro Tools systems and some Third Party software products use the Macintosh Sound Manager to route audio in and out of your system via Digidesign's sound drivers. In order for Pro Tools to function properly on these systems, it is necessary that you configure the Sound Manager-related functions of your system using the Sound Control Panel in the Apple menu.

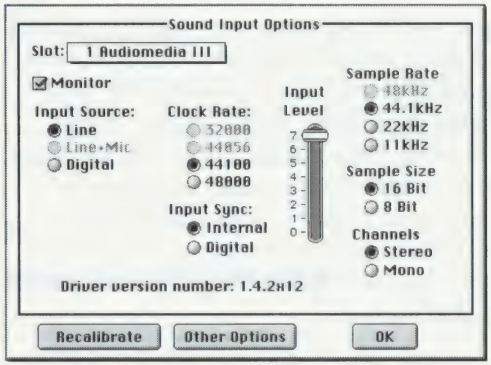
To configure the Digidesign Sound Drives:

1. From the Apple menu, choose Control Panels and choose Sound from the sub menu. The Sound Control Panel appears.
2. Click the pop-up menu at the top of this window and choose Sound In.

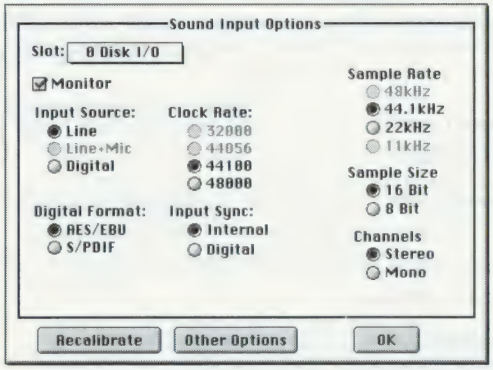


3. Select the Digidesign sound input device icon.
4. Click Options to configure the parameters for the type of card and Audio Interface in your Pro Tools system. The Sound Input Options dialog appears. (Please note that not all of the instructions and parameters explained below apply to every Pro Tools configuration.)

If you have chosen "No Peripheral" or "882/20 I/O" in the Playback Engine Setup dialog, the "Options" button will not be available.



Sound Input Options for Audiomedia systems



Sound Input Options for Pro Tools III and Pro Tools Project systems

5. If you have multiple Digidesign audio cards, select the one you want for input from the Slot pull-down menu.
6. In this dialog, you can select the following:

Input Source This selects the Line and Digital inputs of your Audio Interface or card as the source for your recording.

Digital Format This selects the digital audio format (AES/EBU or S/PDIF) for the Audio Interface only when the Input Source is switched to Digital.

Clock Rate This sets the internal oscillator sample rate of the audio interface or card.

Input Sync This selects the clock mode (Internal or Digital) for your Audio Interface or Audiomedia card. Internal mode should be active whenever the Audio Interface or card is not synchronized to an external clock source. When Internal mode is active, the sample rate of the Audio Interface or card is generated by its internal crystal oscillator (the internal clock frequency used is determined by the Clock Rate setting). Digital mode should be active whenever you input material from DAT machine s.

Your Audio Interface uses its Channel 1-2 digital input for its clock reference. If you wish to synchronize your system to an external digital clock source, it must be connected to Digital Inputs 1-2 of your Audio Interface.

Input Level This sets the input gain level of your Audiomedia card.

Sample Rate This selects the resultant sample rate of your recorded file. The Sound Drivers will convert the sample rate of your file during the recording process to the selected rate.

Sample Size This selects the resultant sample size (16-bit or 8-bit) of your recorded file.

Channels This selects the channel type (Stereo or Mono) of your recorded file.

7. Click Other Options to open the Other Options dialog to further configure the parameters for your audio interface or card, exactly as you learned earlier in the Playback Engine Setup dialog. When you are finished, click Done to return to the Sound Input Options dialog.
8. Click Recalibrate to reset the analog inputs on the audio interface or card, taking care of any DC offset that might result in altered sample values in recording from those analog inputs. The audio cards are automatically recalibrated upon start up, and, in general, you shouldn't have to worry about using this function.
9. Click OK when you are done.

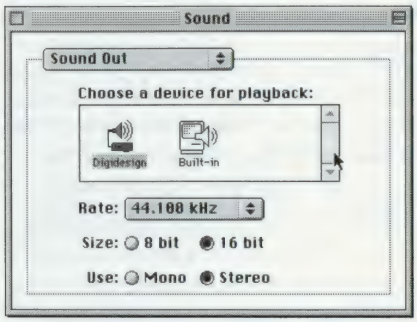
To record from the Sound control panel:

1. Select Alert Sounds from the pull-down menu.
2. In the Alert Sounds dialog, click Add. The following dialog appears:

3. If you have an input line correctly connected to your Digidesign audio interface or card, you should be receiving signal. Test the volume by looking at your speaker icon. You should see "waves" coming out of the speaker icon. In general, you'll want to record and playback at full volume, and monitor the output and input levels on your external gear. This is the best practice for optimum headroom in your recordings. However, if you see a vertical line next to the waves (as in the illustration above), this means that your are clipping, and you should turn down the input level from your source. (Or, alternatively, from the Sound Input Options dialog if you are using an Audiomedia card).
4. Record and save the desired sound.
5. To hear it, select it from the list of System Sounds.

To route sound out of the Digidesign Audio Card:

1. Select the Sound Out pop-up menu item.



The Sound Out dialog

2. Select the Digidesign sound output device.
3. Assuming you have an output line going from your Digidesign audio card to a receiving unit, you should be able to hear your results. Select Sound Out and go back to your Alert Sounds. Then select individual sounds to hear them played through your Digidesign audio card.

Applications send sound to the Sound Manager for processing. Since this is system software, the speed of your computer and the format of your sound may affect your output results. If you have a degradation in performance, the solution is to use a faster CPU and to make sure that the Sound Driver settings match the format of your sound.

For example, if you are playing a 8-bit, 22 kHz, mono sound file, don't set the output to play a 16-bit, 44.1 kHz stereo sound. The Sound Manager may not be able to process the sound fast enough and will drop sample values to zero until it can process more samples. The audible result is similar to "fuzz" distortion. Also, to lessen the processing load on the Sound Manager, avoid sending it multiple sounds at the same time—especially if the sounds are of different formats. Finally, all sounds sent through the Sound Manager to a Digidesign card are sent out at 44.1 kHz, regardless of the original sampled format. Since it takes more CPU processing for the Sound Manager to convert a 22 kHz file to 44.1kHz for playback, it is a good idea to turn all of the sounds you play through the Digidesign card into 44.1 kHz files.

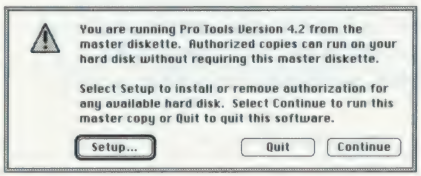
Some applications that use the Sound Manager may allow recording and playback at the same time. However, both input and output cannot occur at the same time through the same audio card using the Digidesign Sound Drivers. If you attempt such a function, a system error will occur.

Deauthorizing Pro Tools

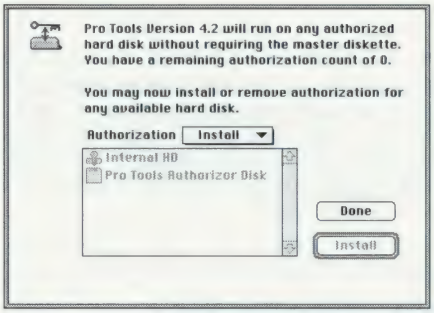
Your Pro Tools Authorizer Disk allows you to authorize a single copy of the Pro Tools application and Plug-Ins. Once you have used this, you cannot perform additional authorizations until you reclaim the authorization using the Pro Tools DeAuthorizer. The following section explains how to do this.

To deauthorize Pro Tools:

1. Make sure that the hard disk you want to deauthorize is connected to the Macintosh and appears on the Finder's Desktop.
2. Insert the Pro Tools Authorizer Disk into your diskette drive.
3. If you wish to deauthorize the Pro Tools application, double-click the file named "Pro Tools 4.2 DeAuthorizer."
4. In the dialog that appears. Click Setup.


You are running Pro Tools Version 4.2 from the master diskette. Authorized copies can run on your hard disk without requiring this master diskette.
Select Setup to install or remove authorization for any available hard disk. Select Continue to run this master copy or Quit to quit this software.
Setup...
Quit
Continue

5. A second dialog appears, showing a list of connected hard drives. From the Authorization pop-up menu, select Remove, then select the appropriate hard drive.


Pro Tools Version 4.2 will run on any authorized hard disk without requiring the master diskette. You have a remaining authorization count of 0.
You may now install or remove authorization for any available hard disk.
Authorization
Install
Internal HD
Pro Tools Authorizor Disk
Done
Install

6. Click the Remove button. The Deauthorizer removes the authorization from the selected hard drive. A dialog will appear confirming successful deauthorization. Click OK to proceed.
7. Click Done to return to the Finder.

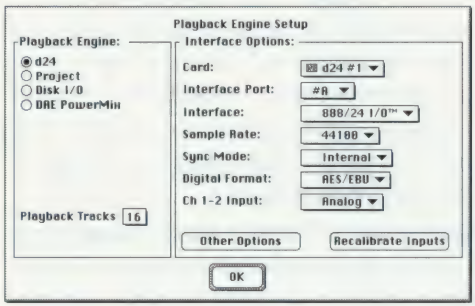
Deauthorization is now complete. If you now try to launch Pro Tools, a dialog will appear informing you that "This is an unauthorized copy" every time you start the application. This dialog only appears if you try to launch Pro Tools on a hard disk that is not authorized.

Deauthorization can also be performed with the Pro Tools Installer using its Remove feature. If you select Pro Tools for removal, the Installer will ask you to insert the Pro Tools Authorizer Disk to retrieve the authorization key.

Do not lose or alter your Pro Tools authorization diskette! You will not be able to complete an installation without it. Keep the diskette in a safe place to avoid any accidents.

Changing Pro Tools' Playback Engine

Pro Tools allows you to select different "Playback Engines" depending on your system configuration by using the Playback Engine command in Pro Tools' Setup menu. Your choice of Playback Engine dictates which Pro Tools-compatible audio card is used to provide Pro Tools with its recording, playback and editing features (You can also choose to use a Power Macintosh's built-in audio capabilities by choosing DAE PowerMix as your Playback Engine). Supported Digidesign cards include the Pro Tools d24, Disk I/O card, Project card, or Audiomedia III card.



The Playback Engine dialog

A Pro Tools session created on one Pro Tools system configuration can be opened and used on a different Pro Tools system configuration. However, if you change your Playback Engine mid-session, a dialog will appear informing you that the session will be saved, closed and reopened to enable your new Playback Engine choice. Pro Tools must do this in order to adjust its track layout and voice allocation.

Please be aware that changing your playback from a TDM-equipped choice (such as d24 or Disk I/O) to a non-TDM choice (such as DAE PowerMix) will cause you to lose any TDM-specific setups such as effects sends and auxiliary inputs when you reopen the session.

The DAE PowerMix option will not appear as a Playback Engine choice unless you have installed DAE PowerMix into your DAE Extensions Folder and have allocated sufficient memory to DAE using the DAE application's "Set Playback Buffer Size" command. To allocate sufficient memory to DAE, quit Pro Tools, double-click DAE (inside the DAE folder within your System Folder), choose the "Set Playback Buffer Size" command, set the buffer size accordingly, then close DAE. When you reopen Pro Tools, DAE PowerMix should appear as a Playback Engine choice.

Changing DAE's Playback Buffer Size

The Digidesign Audio Engine (DAE) is Digidesign's real-time operating system for digital audio. When you install Pro Tools, DAE is automatically installed in your System Folder as part of your system.

DAE provides much of the hard disk recording, digital signal processing, mix automation, and MIDI functionality of your Pro Tools system. DAE is actually a separate application from Pro Tools, but you generally don't have to be concerned with it. When you start Pro Tools, DAE automatically starts in the background. When you quit Pro Tools, DAE will automatically quit, too.

The only case where you may wish to configure DAE is if you wish to change its playback buffer size. DAE's playback buffer size determines how not only how much of your computer's RAM is used by DAE (and the Pro Tools Playback Engine you have chosen), but also the amount of memory allocated within DAE to manage disk buffers, which affect your system's performance.

Though DAE automatically selects the optimal playback buffer for your system the first time you open Pro Tools, in certain cases you may wish to adjust this parameter to modify your system's performance:

- Allocating a larger buffer can sometimes allow for a higher density of edits. This can be useful if you experience system performance problems in sessions with an extremely large number of edits in rapid succession.
- Allocating a smaller buffer can sometimes improve playback/recording initiation speed. This can be useful if you are experiencing a time lag when you initiate playback/recording.

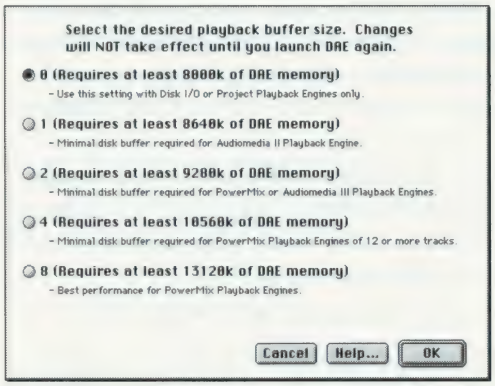
However, you should also note the follwoing:

- Choosing a smaller buffer can make it difficult for slower hard disks to play or record tracks reliably.
- Choosing larger buffer can cause a time lag to occur before playback or recording begins. It can also cause a time lag to occur when you are editing during playback.

Because adjusting playback buffer size will have a definite impact on your system's performance, Digidesign recommends that you use the default, optimal setting automatically chosen for you — unless you must adjust these performance parameters to accommodate a specific need.

To change DAE's Playback Buffer size:

1. If you are running Pro Tools, quit Pro Tools.
2. Locate and open DAE by double-clicking it. (It is inside the DAE folder within your System Folder.)
3. From DAE's File menu, choose Set Playback Buffer Size. The Playback Buffer dialog appears. This dialog contains a Help button which provides additional information about choosing an appropriate DAE playback buffer size.
4. Choose the desired playback buffer size. (0, 1, 2, 4, or 8) and Click OK.
5. Quit DAE. The next time you open Pro Tools, it will use the playback buffer size you have selected.


Select the desired playback buffer size. Changes will NOT take effect until you launch DAE again.
0 (Requires at least 8800k of DAE memory)
- Use this setting with Disk I/O or Project Playback Engines only.
1 (Requires at least 8640k of DAE memory)
- Minimal disk buffer required for Audiomedia II Playback Engine.
2 (Requires at least 9280k of DAE memory)
- Minimal disk buffer required for PowerMix or Audiomedia III Playback Engines.
4 (Requires at least 10560k of DAE memory)
- Minimal disk buffer required for PowerMix Playback Engines of 12 or more tracks.
8 (Requires at least 13120k of DAE memory)
- Best performance for PowerMix Playback Engines.
Cancel
Help...
OK

DAE's "Set Playback Buffer Size" dialog

Troubleshooting

If you are having trouble getting your Pro Tools system to work properly, the following checklist may help you solve the problem.

If your Pro Tools III or Pro Tools Project drive doesn't appear on your Desktop when you start your Macintosh:

- Is the drive properly connected to the Pro Tools card? Check for loose cables and proper termination.
- Are you turning on the drive and letting it come up to speed before you turn on your Macintosh? If not, do so. Allow at least ten seconds for the drive to come up to speed before you switch on your Macintosh.
- When your Macintosh starts up, does the DigiSystem INIT icon appear at the bottom of your screen with an error message such as "No Drive" through it? If so, there may be a problem with the connections between your Pro Tools card and hard drive(s). Recheck for loose cables and proper termination.
- Is Virtual Memory turned off? If not, open the Memory Control Panel and set Virtual Memory to off. Then restart your computer.
- When you bought your hard drive, was it initialized for the Macintosh? If not, you'll have to disconnect the drive from the Pro Tools card, connect it to the Macintosh SCSI port, and initialize it with the formatting software included with the drive. (If you find that the drive appears on the Desktop as soon as you connect it to the Macintosh SCSI port, then it is already initialized for the Macintosh.)
- Is the SCSI ID of the drive set to an ID number less than 7? If not, make sure that it is.

If the Pro Tools software won't start:

Is your Audio Interface turned on?

- Are your Pro Tools cards installed in the correct order inside your computer?
- Is DAE installed in the DAE Folder inside your System Folder? If not, use your Pro Tools Installer disks to install it.
- Is the DigiSystem INIT installed in the Extensions folder (inside your System Folder)? If not, use your Pro Tools Installer disks to install it.
- Does your computer have enough RAM (random-access memory)? Please refer to the RAM requirements in Chapter 1 of this Installation Guide for the amount of RAM your computer needs in order to run Pro Tools. To find out how much memory your computer has, choose About this Macintosh in the Finder's Apple menu. A window will appear telling you how much memory is currently installed in your Macintosh.
- Is Virtual Memory turned off? If not, open the Control Panels folder (in your System Folder), double-click the item called Memory, and turn off Virtual Memory. Then restart your computer.

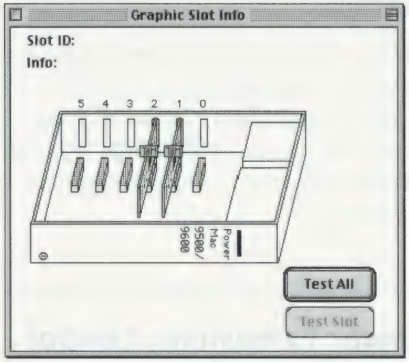
If you get an error message when you try to start the Pro Tools application:

1. Make sure that the default set of Mac OS System Extensions is enabled on your computer. Pro Tools will not function properly otherwise. To enable the default Mac OS System Extensions, choose the Extensions Manager Control Panel from the Apple Menu. When the Extensions Manager appears, choose Mac OS 8.0 Base from the Selected Set pop-up, then enable the DigiSystem INIT and click the Restart button to restart your computer.
2. Try a complete restart. (Turn off your Audio Interfaces, computer peripherals and your Macintosh CPU, and then turn them on again.)
3. If you still get an error message, you can use the DigiTest™ application (included in your Pro Tools Utilities folder) as a diagnostic tool to verify that your Digidesign card is operational and correctly installed. This software also allows you to run a diagnostic test on the cards in your system.

Using DigiTest As a Diagnostic Tool

To use the DigiTest application as a diagnostic tool:

1. Locate DigiTest. It should be located inside the Pro Tools Utilities folder (within the Pro Tools folder).
2. Start the DigiTest application.
3. When DigiTest opens, a picture of your CPU will appear. This illustration shows which Digidesign cards are installed in your system. If one (or more) of your cards does not appear here, it may indicate that it has not been installed properly in your CPU. If this is the case, you should shut down your system and reinstall it.



The DigiTest Utility

4. You may also want to run a diagnostic test on the cards in your system. To do this, simply click the Test All button in the DigiTest window. DigiTest will run a diagnostic test, and after a few moments a window will appear summarizing the results for each card. This test will list results for ALL possible slots—including some that may not apply to your system. Please refer to the results for the slots in your system only.
5. If an "X" appears on any of the cards in the diagram, or if the text window summary reports that any of the cards has "failed," this indicates that there may be a problem with the card. If this is the case, double-click on the card in the diagram, and DigiTest will give additional information about the problem.
6. If DigiTest does report a problem with your system, write the information down so that you can report it to Digidesign or your local Digidesign Technical Support Representative.

If All Else Fails...

If you've tried everything and still can't seem to get your Pro Tools system to work, call your local Digidesign representative and ask for assistance. Contact information is included with your system. The Digidesign Technical Support Team will do everything they can to help you get up and running.

Problematic Extensions, Control Panels and Parameters

There are several Extensions, Control Panels and Macintosh parameters that may adversely affect the performance of Pro Tools. These include:

AppleTalk Leave AppleTalk disabled unless you are using it for network interchange of audio files. Leaving AppleTalk in use when not necessary can compromise the performance of your system.

Cache Size This Memory Control Panel setting allows you to change the size of the cache. The default size is different for each CPU/RAM configuration, and changing the buffer size may lead to unwanted audio artifacts. A value of 128k has proven to be a reliable setting on most Macintoshes. On higher speed CPUs, this value may be increased up to 512k with no ill effect.

Screen Savers After Dark, Moire, Pyro and others should be completely removed before running Pro Tools.

Virtual Memory Pro Tools will not launch if Virtual Memory is active. To disable it, open the Memory Control Panel, disable Virtual Memory and restart the Macintosh.

Calculate Folder Sizes If Calculate Folder Sizes is enabled in the Views Control Panel, it may cause enough CPU/disk overhead to cause Pro Tools to report DAE -9073 errors (disk too slow). Disable this setting to prevent the errors.

CD-ROM Extensions/Control Panels Many CD-ROM & Removable Media Extensions/Control Panels have been linked to audio quality problems, and in severe cases, system crashes. To prevent such problems, remove the Extension/Control Panel and restart your computer.

Using Digidesign Cards with Multimedia Software

Version 3.0 and later of the Apple OS's Sound Manager has the capability record and play back 16-bit, 44.1 kHz, stereo audio in any application that supports this format, including most multimedia applications and games. By using the Digidesign Sound Drivers, Sound Manager-compatible applications can use Digidesign audio cards for higher quality input and output.

Here are some tips on using the Sound Drivers with popular multimedia applications:

Adobe Premiere 3.0 or greater

- Any version of Adobe Premiere earlier than 3.0 will work incorrectly with the Sound Manager and consequently the Digidesign Sound Drivers.
- Premiere has many hidden preferences. Be sure to set all of them to the same specs as your Sound Control Panel. For example, avoid setting Preview files to 8-bit, 22 kHz, mono if the Control Panel is configured for 16-bit, 44.1 kHz, stereo.
- Sounds from the "Clip" window are often distorted. Fortunately, the files are typically not damaged. Performing a Print to Video command or opening up QuickTime movies in other applications should give you the result you expect.
- Capturing and playback work best if you use a RAM Disk. Using two fast hard drives (one for video and another for audio) will also give better results than a single hard disk.

Avid VideoShop 2.0 or greater

- Any version of VideoShop earlier than 2.0 will work incorrectly with the Sound Manager and consequently the Digidesign Sound Drivers.
- The Overdub Audio function allows input and output to occur at the same time. However, if input and output are set to the same audio card, an error will occur. For single audio-card systems, set the output to the Macintosh speaker and the input for the Digidesign audio card when performing overdubs. For multiple audio cards, select one card for input and another for output.
- Capturing and playback is best if using a RAM Disk. Using two, fast hard drives (one for video and another for audio) will also give better results than one hard disk.

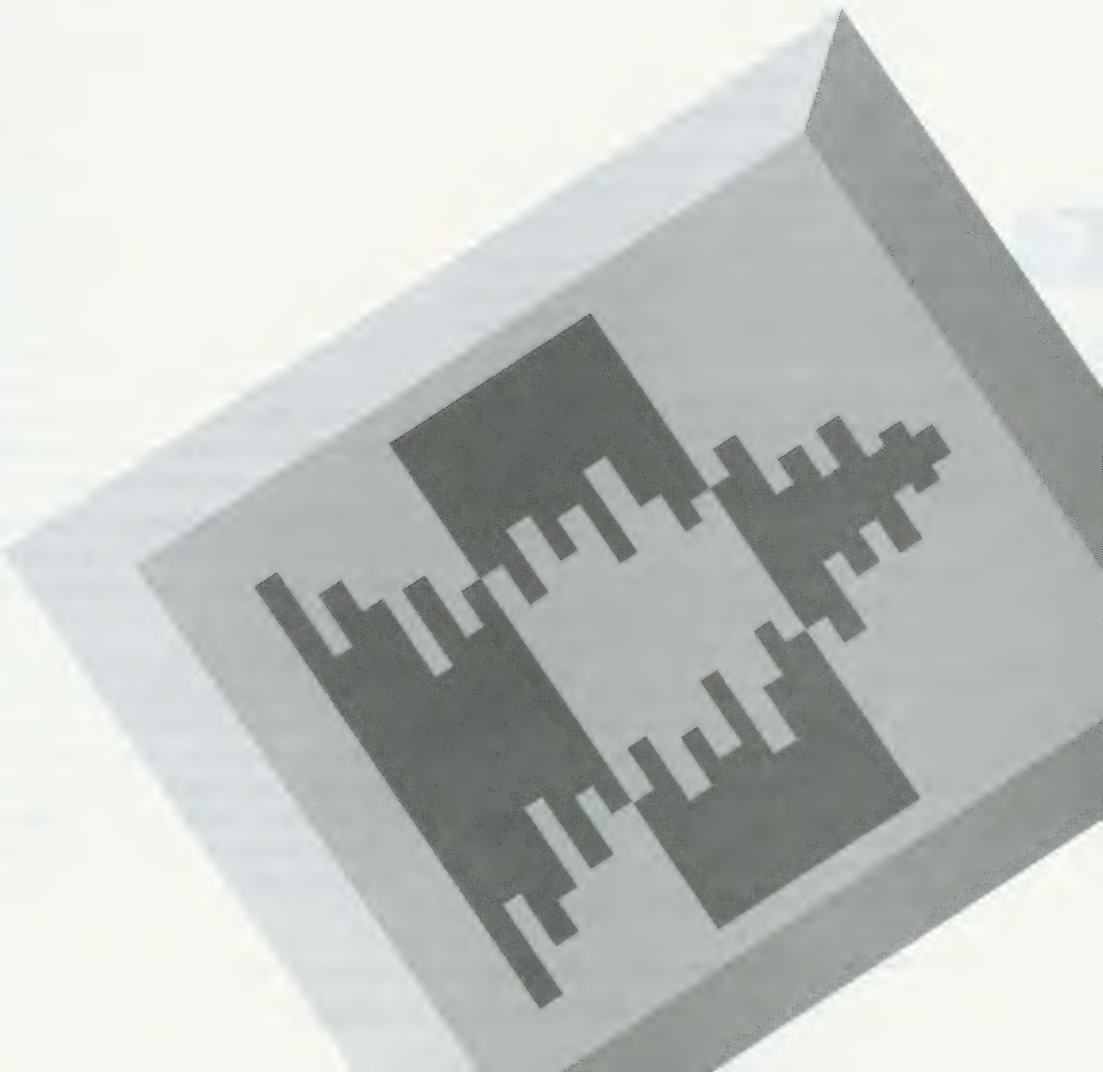
Action! 1.0

- This program takes a lot of processing power on its own, so it's much more susceptible to the pitfalls of working with 16-bit stereo files. Yet, it is compatible with the Digidesign Sound Drivers.

MacroMedia Director 3.1.3 or greater

- Any version less than 3.1.3 will work incorrectly with the Sound Manager and consequently the Digidesign Sound Drivers.
- MacroMedia Accelerator movies work.
- The Sound Utility that comes with Director 3.1.3 only works on MacroMedia sound files (those made for the MacRecorder).

Installing and Configuring OMS



Chapter 7

Installing and Configuring OMS

Introduction

Opcode's Open Music System™ (OMS) is a set of extensions and programs that bridge the gap between MIDI applications and MIDI hardware. It has many functions and features:

- OMS acts as a central MIDI driver. OMS-compatible applications such as Pro Tools use OMS to communicate with all of your MIDI-based hardware (such as synchronization peripherals, synthesizers, drum machines, effects devices, or MIDI controllers).
- OMS provides a central location for defining and storing a detailed description of your MIDI studio. Use the OMS Setup application to create a Studio Setup document, in which you store a detailed description of the MIDI devices in your studio—including their names, their MIDI channels, and how they're all physically connected. All OMS-compatible applications reference this Studio Setup document. So, if you change your studio in any way, simply modify your Studio Setup document and all OMS-compatible applications are immediately aware of the change.
- OMS handles all your computer's internal MIDI timing. This allows you to run multiple OMS-compatible applications simultaneously and in perfect synchronization.
- OMS gives you access to hundreds of MIDI channels. The actual number of MIDI channels that OMS can access depends on which MIDI interface(s) you use. Standard MIDI interfaces (such as Opcode's MIDI Translator) access 16 total MIDI channels. Multi-port MIDI Interfaces (such as Opcode's Studio 4 or Studio 5) access 16 MIDI channels on each pair of MIDI In/Out jacks. For example, since a Studio 5 has 15 pairs of MIDI In/Out jacks, it can access 240 total MIDI channels. For more information, see your MIDI interface manuals.

About This Chapter

This chapter assumes you have a basic working knowledge of OMS and its operating conventions, including connecting MIDI interfaces, creating Studio Setup documents, configuring OMS drivers, defining and connecting MIDI devices. If you need to review details on working with OMS, refer to the online OMS User's Guide, which is installed with OMS.

Additionally, the OMS documentation includes special documents called Technical Publications that address specific topics not covered in the OMS User's Guide. They cover a wide variety of MIDI hardware configurations, including using OMS with a MIDI patchbay and a MOTU MIDI Time Piece™, and include Menu references guides, performance and troubleshooting tips.

This chapter accurately describes OMS operations at the time of its printing. However, updates and changes may occur. Therefore, you should always look for the latest information in the Read Me files installed with the OMS Installer.

You can also download the latest Technical Publications for OMS (or any other Opcode products) from Opcode's World Wide Web site: www.opcode.com

If you don't have Web access, you can contact Opcode to receive Technical Publications for OMS through the mail. For more information about contacting Opcode, see the section Creating a New Studio Setup Document in the OMS User's Guide.

Finally, this chapter assumes that you have a basic understanding of MIDI. If you don't, you may wish to

purchase one of the many basic MIDI reference books available from your local book store or music retailer.

Installing OMS

During Pro Tools installation, Opcode's OMS Installer is copied to the same drive on which you installed Pro Tools. The OMS Installer is copied to a folder named "OMS Installer" on the root directory of your selected Pro Tools drive, and the folder is automatically opened so that it can easily be found.

If you recall, when you installed Pro Tools software, a dialog appeared at the end of the installation instructing you to run the OMS Installer in order to install OMS. If you followed the instructions given in Chapter 6, OMS should already be installed (but not yet configured) on your system. If this is the case, please skip to the section that follows this to learn how to configure your Pro Tools/OMS MIDI setup.

To install OMS on your computer:

1. Connect your MIDI interface to your Macintosh (as described in your MIDI interface manual).
2. Connect your MIDI devices (synthesizers, drum machines, effects units) to the MIDI interface, then power them on.
3. If you are using any virus-protection software, turn it off or temporarily remove it and restart your Macintosh.
4. Insert the Pro Tools 4.2 Installer disc in your CD-ROM drive and double-click the file named "Install Pro Tools."
5. When the Installer screen appears, click Continue to proceed. Select the hard disk on which you wish to install OMS using the Switch Disk button. For maximum reliability, we recommend that you install to your Startup drive, or a drive that is connected to the Macintosh SCSI bus.
6. Click the triangle next to the installation package for your particular Pro Tools system to reveal that package's contents.
7. Select the OMS Software option and click Install.
8. After you have clicked Install, follow the on-screen instructions. The Open Music System extension is placed into the Extensions folder. A folder named "OMS Folder" is created within the System Folder, and OMS drivers are placed inside it. OMS applications are placed inside the "OMS Applications" folder that, depending on the installer, resides either at the top-level of your hard drive or in a folder named "Opcode."
9. When the installation is complete, a message will appear indicating that the installation was successful. Click OK to restart your Macintosh. (After restarting, don't forget to turn back on any virus-protection software that you may be using.)

If you are updating from an older version of OMS, your previous Studio Setup documents will be read by the new OMS Setup application.

Do not relocate or rename any files or folders that the OMS Installer places in the System Folder. You can move the applications folder, but the extension and OMS Folder must remain in their initial locations. You may delete unnecessary files, but some files are essential for OMS operation. For more information, see the section "Software Definitions" in the OMS User's Guide.

OMS QuickTime Musical Instruments are not supported. Please make sure that this feature is turned off before launching Pro Tools.

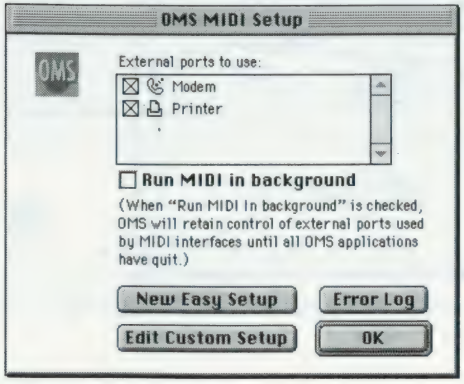
Preparing Your Pro Tools MIDI Setup to Work with OMS

The following section provides instructions for configuring your MIDI setup with OMS. If you have arrived at this section of your Installation Guide by jumping directly here from the end of the Demo Installation procedure in Chapter 6, and if Pro Tools is already open, please skip ahead to step 4 in the instructions that follow.

If Pro Tools is not already open, please start from the beginning of the instructions that follow.

To prepare Pro Tools to work with OMS:

1. Make sure that your MIDI modules and controllers are connected to your MIDI interface(s), and that the MIDI interface is connected to the Macintosh. Make sure all devices are powered on.
2. Double-click the Pro Tools application icon to open Pro Tools.
3. A dialog appears prompting you to configure OMS. Click Cancel here and go to the next step instead.
4. From the Pro Tools Setups menu, choose the OMS MIDI Setup command. The OMS MIDI Setup dialog will appear, allowing you to select the serial port(s) you wish to use with Pro Tools. After you have chosen the desired port(s), click OK.


OMS MIDI Setup
OMS
External ports to use:
Modem
Printer
Run MIDI in background
(When "Run MIDI In background" is checked, OMS will retain control of external ports used by MIDI interfaces until all OMS applications have quit.)
New Easy Setup
Error Log
Edit Custom Setup
OK

The OMS MIDI Setup dialog

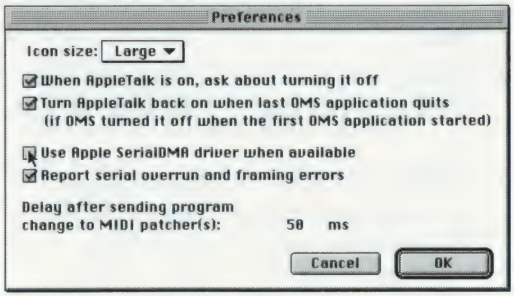
If you want external controllers to continue to operate when Pro Tools is not the foreground application, or wish to edit SampleCell II parameters while Pro Tools is running, please enable (check) the Run MIDI In Background option in the OMS MIDI Setup dialog.

If you are using Opcode Systems' Studio 5 MIDI interface, you must set it to "Emulate MTP" mode to be fully compatible with Pro Tools.

Pro Tools 4.2 requires that you deselect the "Use Apple Serial DMA driver when available" preference in OMS Setup. If you do not disable this option, problems will occur with MIDI and synchronization functions in Pro Tools 4.2.

To disable Serial DMA in OMS:

1. Choose Preferences from OMS Setup's Edit menu.
2. Deselect the Use Apple Serial DMA Driver option.
3. Click OK to close the Preferences window.


Preferences
Icon size: Large
When AppleTalk is on, ask about turning it off
Turn AppleTalk back on when last OMS application quits
(if OMS turned it off when the first OMS application started)
Use Apple SerialDMA driver when available
Report serial overrun and framing errors
Delay after sending program
change to MIDI patcher(s): 50 ms
Cancel
OK

Disabling Serial DMA in OMS Setup

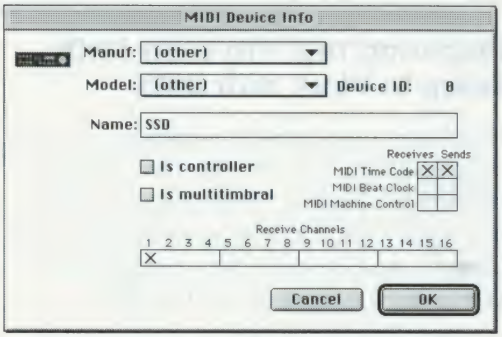
If you are using a Digidesign SMPTE Slave Driver

If you are using Digidesign's SMPTE Slave Driver to synchronize Pro Tools to SMPTE Time Code, you must define your SMPTE Slave Driver as an OMS device in the OMS Setup dialog.

To configure OMS for use with a Digidesign SMPTE Slave Driver:

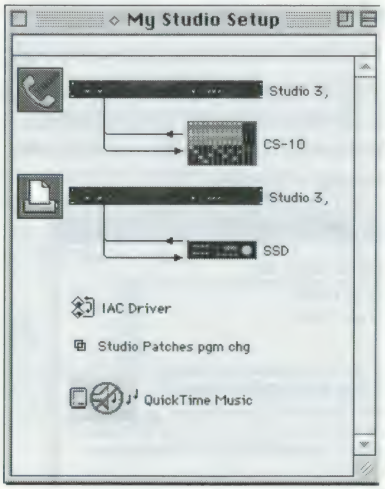
In OMS Setup:

1. Launch the OMS Setup application. (You can also launch OMS Setup from within Pro Tools by choosing the OMS Studio Setup command in the Setups menu.) The OMS Setup window appears.
2. From the Studio menu, choose the New Device command.
3. In the MIDI Device Info window that appears, leave blank the Manufacturer and Model names and name the device SSD.
4. Disable (uncheck) both Is Controller and Is Multitimbral.
5. Enable (check) both Receives and Sends MIDI Time Code,
6. Disable (uncheck) Receives and Sends MIDI Beat Clock, and Receives and Sends MIDI Machine Control.
7. Enable (check) the Receive Channel you wish to send MIDI System Exclusive control messages to the SMPTE Slave Driver.



Defining the SMPTE Slave Driver as an OMS MIDI Device

8. Click OK to close the MIDI Device Info window, and save the changes to your current OMS Setup document.
9. Back in the OMS Setup window, make sure that the SMPTE Slave Driver is connected to the correct OMS port location or MIDI interface. Arrows connecting the SMPTE Slave Driver to and from the desired port or MIDI interface signify a connection has been made.

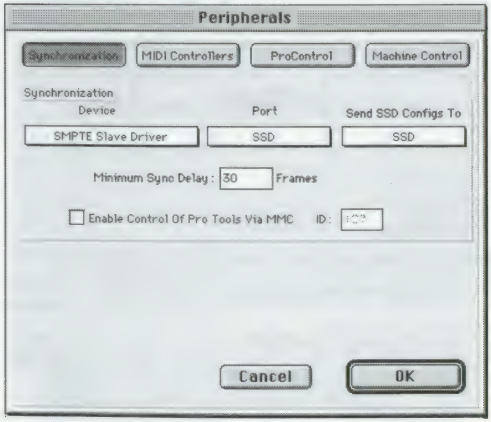


Connecting the SMPTE Slave Driver in the OMS Setup window

If you are running version 2.3.2 or later of OMS, you must remove the infinity symbol ("∞") from the IAC Bus name used by Pro Tools for MIDI Machine Control. Failure to do so will result in problems using MIDI Machine Control with Pro Tools. You should double-click the IAC Driver icon, and type "IAC1," for example, to rename the IAC bus.

In Pro Tools:

10. From the Setups menu, choose the Peripherals command. The Peripherals dialog appears.
11. Click the Synchronization button. The Synchronization window appears.
12. From the Device pop-up menu, choose SMPTE Slave Driver. Then, from the Port and Send SSD Configs To pop-up menus, choose the OMS port location that you defined in OMS Setup. Click OK to close this dialog.



Enabling the SMPTE Slave Driver in the Peripherals dialog

If you are running Pro Tools and you are using Opcode Systems' Studio 5 MIDI interface, you must set the latter to "Emulate MTP" mode to be fully compatible with Pro Tools.

If you are using a Digidesign Universal Slave Driver

If you wish to use a Digidesign Universal Slave Driver with Pro Tools, we suggest that you use its direct serial connection and proprietary serial protocol for near sample-accurate synchronization. Please refer to your Universal Slave Driver User's Guide for more detailed instructions for connecting and configuring a Universal Slave Driver with Pro Tools.

If You Are Using a MIDI Controller

If you are using a MIDI controller such as the JL Cooper CS-10, Peavey PC-1600 or Penny & Giles DC16/MM16, for hands-on control of Pro Tools, you must also configure your MIDI controller as an OMS device.

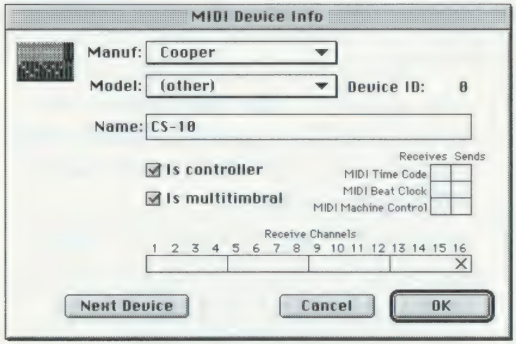
To configure OMS for use with a MIDI controller:

In OMS Setup:

1. Make sure that your MIDI controller(s) are connected to your MIDI interface(s), and that the MIDI interface is connected to the Macintosh. Make sure all devices are powered on.
2. Launch the OMS Setup application. (You can also launch OMS Setup from within Pro Tools by choosing the OMS Studio Setup command in the Setups menu.) The OMS Setup window appears.
3. From the Studio menu, choose the New Device command.
4. In the MIDI Device Info window that appears, select your MIDI controller in the Manufacturer and Model pop-up menus. If the Manufacturer and Model names are not listed in these menus, type the name of your controller in the Name field.
5. Enable(check) both the Is Controller and Is Multitimbral options.
6. Disable (uncheck) both Receives and Sends for MIDI Time Code, MIDI Beat Clock, and MIDI Machine Control.

7. Enable (check) the Receive Channel(s) you wish to send data to and from the MIDI controller. If your MIDI controller is the only device connected to a port on a multi-port MIDI interface (such as the MOTU's MIDI Time Piece II or Opcode's Studio 4), you can leave all receive channels checked, since there will be no potential channel conflicts.

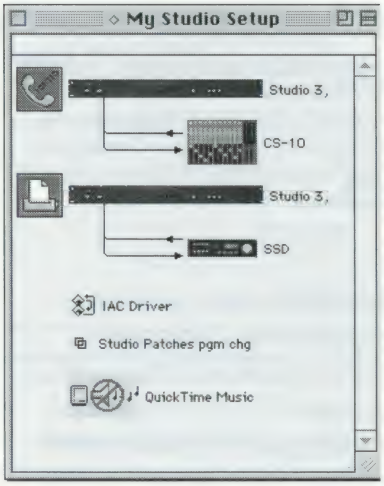
Both the Penny & Giles MM16/DC16 and the JL Cooper CS-10 main unit always transmit on MIDI channel #16; the optional eight fader CS-10x expander units always transmit on MIDI channel #15. This means you must set the Receive channel in the MIDI Device dialog to 16 and 15, respectively. However, the Peavey PC-1600 allows you to select the MIDI channel to receive data.



Defining a MIDI controller as an OMS MIDI Device (using the JL-Cooper CS-10 as an example)

8. Click OK to close the MIDI Device Info window.
9. Back in the OMS Setup window, make sure that the MIDI controller is connected to the correct OMS port location or MIDI interface. Arrows connecting the MIDI controller to and from the desired port or MIDI interface signify a connection has been made.

You can change the MIDI controller icon to match the visual look of your controller by clicking the icon and choosing the Device Icon command in the Studio menu.

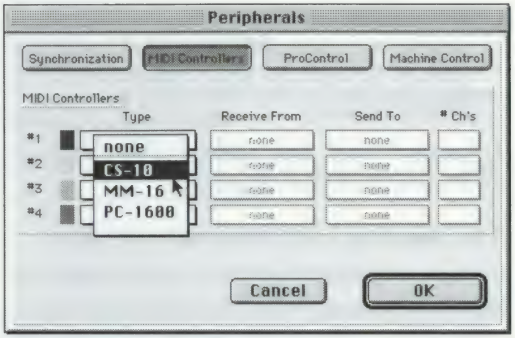


Connecting the MIDI controller to the correct port or MIDI interface in the OMS Setup window

10. You can configure additional MIDI controllers by repeating the above steps. Pro Tools can accommodate up to four MIDI controllers. However, make sure that none of the controllers are assigned to the same MIDI port and channel assignment.
11. Save the changes to your current OMS Setup document.

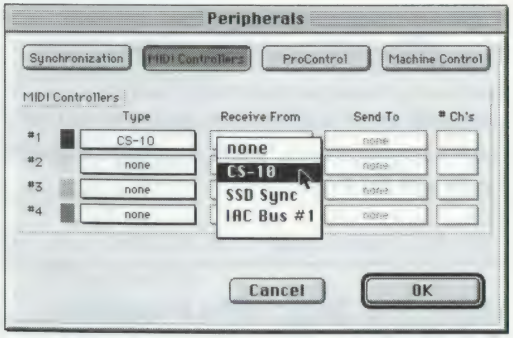
In Pro Tools:

12. From the Setups menu, choose the Peripherals command. The Peripherals dialog appears.
13. Click the MIDI Controllers button. The MIDI Controllers window appears. From the Type pop-up menu, choose the name of your MIDI controller.



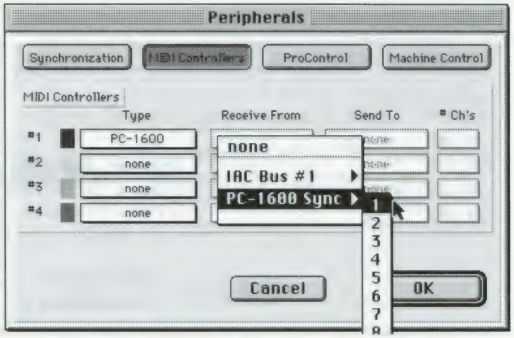
Choosing the type of MIDI controller

14. From the Receive From pop-up menu, choose the desired OMS source port. This should correspond to the MIDI controller port that you defined in your OMS Setup document.



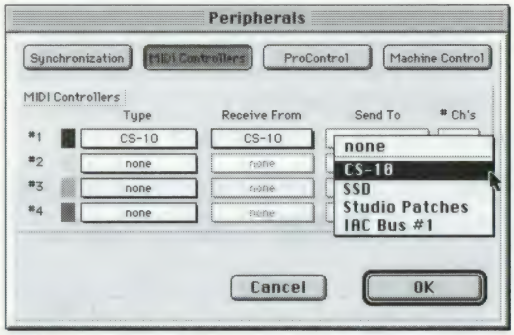
Choosing the OMS source port to receive data from the MIDI controller

15. Additionally, if you are using the PC-1600 MIDI controller, in the submenu for the OMS source port, select the desired MIDI channel from which to receive data. (Both the MM16/DC16 and the CS-10 main unit always transmit on MIDI channel #16, and the optional eight fader CS-10x expander units always transmit on MIDI channel #15.)



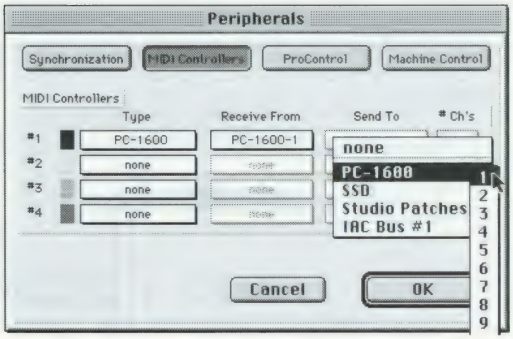
If you are using a PC-1600, choose the MIDI channel to receive data in addition to the OMS source port

16. From the Send To pop-up menu, choose the desired OMS destination port.



Choosing the OMS destination port to send data to the MIDI controller

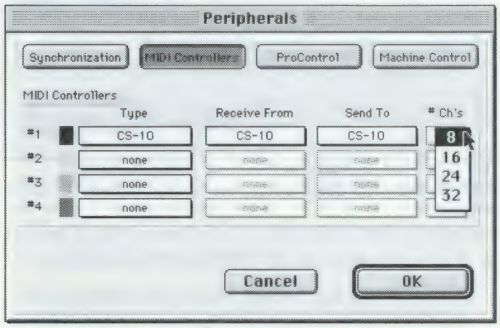
17. If you are using the PC-1600, select the desired MIDI channel to transmit data in the submenu for the OMS destination port. (Both the MM16/DC16 and the CS-10 main unit always receive on MIDI channel #16, and the optional eight fader CS-10x expander units always receive on MIDI channel #15.)



If you are using a PC-1600, choose the MIDI channel to send data in addition to the OMS destination port

18. If your MIDI controller has more than eight channel strips (such as JL Cooper's CS-102 with additional CS-10x expansion modules), or if you are using multiple devices of the same type in series, click the # Ch's pop-up menu and choose the appropriate number of channel strips.

19. Click OK when you have finished.



Choosing the number of fader channels for the MIDI controller

If you are using multiple controllers, keep in mind that DSP Plug-In editing will only be supported from the first controller. In the case of the CS-10 family, this restriction also applies to pan and send editing.

20. You can configure additional MIDI controllers (for a total of four) by repeating the above steps. However, make sure that none of the controllers are assigned to the same MIDI source and destination ports or channels in the OMS Setup or the Pro Tools Peripherals dialog.

To learn more about using a MIDI controller, refer to the Pro Tools MIDI Controllers Guide.

If You Are Using a MIDI Keyboard Controller

If you are using a MIDI keyboard controller, enable the MIDI Thru command in Pro Tools' Options menu. A check next to this menu item indicates it is enabled. By doing this, you will be able to play your controller and have your MIDI sound modules respond even when Pro Tools playback is not engaged. When a MIDI track is record-enabled, your MIDI controller will pass data thru to the port and channel specified by the MIDI track.

If You Are Using a Digidesign ADAT Interface

If you are using Digidesign's original ADAT Optical Interface for sample-accurate transfer and editing of Alesis ADAT® digital audio tracks, please refer to its User's Guide for instructions on how to install and configure it for use with Pro Tools.

Using Pro Tools with FreeMIDI Applications

Pro Tools can be used in combination with applications that require Mark of the Unicorn's FreeMIDI extension. If you are running a MIDI application that requires FreeMIDI (such as Performer or Digital Performer) by itself on Pro Tools hardware, this is not a problem — OMS and FreeMIDI extensions can both coexist on the same CPU.

However, if you wish to run Pro Tools together with a MIDI application that requires FreeMIDI, you will need to use Mark of the Unicorn's OMS Emulator. To achieve accurate synchronization, you must set Pro Tools to be

the clock master. Digital Performer is used as an example of this type of setup below.

To synchronize Pro Tools with a MIDI application that requires FreeMIDI:

1. Make sure that the following extensions are in your System Extension folder:

   - FreeMIDI extension, version 1.3.1 or higher

   - OMS Emulator extension, version 1.3.1 or higher

2. Turn off the OMS Extension, either by deselecting it in the Extensions Manager Control Panel or by removing it from your System Extensions folder.
3. Restart your computer.

In FreeMIDI Setup:

4. Launch the FreeMIDI Setup Application.
5. In FreeMIDI Preferences, make sure the FreeMIDI Applications Only and Inter-application MIDI options are enabled.

If Pro Tools is running, quit Pro Tools before launching Performer.

In Performer:

6. Launch Performer. In the Basics menu, enable the MIDI only setting.
7. Choose Receive Sync from the Basics menu, and enable the Inter-application MIDI and "MTC, DTL or DTLe" options.
8. In the Basics menu, enable the Slave to External Sync setting.
9. Click the Play button in Performer's transport window. It flashes, indicating it awaits MIDI Time Code from Pro Tools.

In Pro Tools:

10. Launch Pro Tools. Choose Show Session Setup Window from the Display menu, and choose Digital Performer from the Output Time Code pop-up menu.
11. Verify that the Frame Rate, Format and Start Time are the same in both Performer and Pro Tools.
12. With Performer armed for playback as described above, click the Play button on Pro Tools' transport.

Performer should now synchronize with Pro Tools, with Pro Tools acting as the synchronization master.

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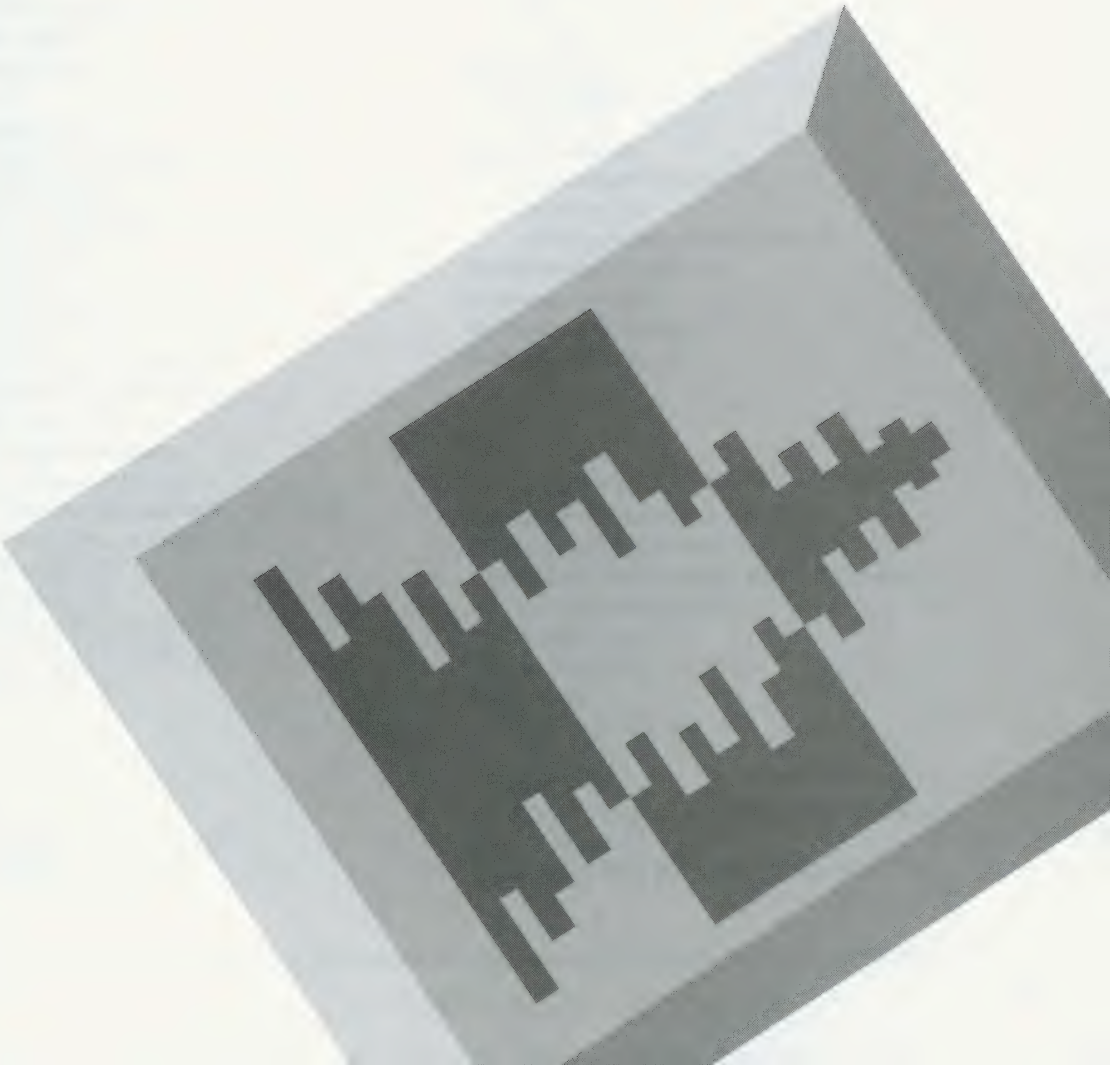

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